NO. 38 NOTES FROM THE SHOP $2.50

Woodsmith®

VIDEO CABINET • DOLL CRADLE

BUNK BEDS

PLUS: SURFACE PREP... FIRST IN A SERIES ON FINISHING

Woodsmith®

Number 38 **Mar/Apr, 1985**

Editor
Donald B. Peschke

Design Director
Ted Kralicek

Assistant Editors
Steve Krohmer
Douglas L. Hicks

Art Director
Kay Mulder

Technical Illustrators
David Kreyling
Mike Henry

Subscription Manager
Sandy J. Baum

Subscription Assistants
Christel Miner
Vicky Robinson
Jackie Stroud
Shirley Feltman
Diana Starr

Computer Operations
Ken Miner

Circulation Manager
Jeff Farris

Administrative Assistant
Cheryl Scott

Building Maintenance
Archie Krause

WOODSMITH (ISSN 0164-4114) is published bimonthly (January, March, May, July, September, November) by Woodsmith Publishing Co., 2200 Grand Ave., Des Moines, Iowa 50312.
WOODSMITH is a registered trademark of the Woodsmith Publishing Co.

©**Copyright 1985** by Woodsmith Publishing Co. All Rights Reserved.

Subscriptions: One year (6 issues) $10, Two years (12 issues) $18. Single copy price, $2.50 (Canada and Foreign: add $2 per year.)
Change Of Address: Please be sure to include both your old and new address.
Second class postage paid at Des Moines, Iowa.
Postmaster: Send change of address notice, Form 3579, to Woodsmith Publishing Co., 2200 Grand Ave., Des Moines, Iowa 50312.

BACK ISSUES

All back issues of *Woodsmith* are still available. Send for a booklet describing the contents and prices of all back issues.

SAMPLE COPIES

If you have a friend who would like to see a copy of **Woodsmith**, just send the name and address, and we'll send a sample (at no cost).

Sawdust

ABOUT THIS ISSUE. There's a good side and bad side to everything, including working on an issue of *Woodsmith*. As we were working on the designs for the projects in this issue, a number of little problems kept popping up.

Over and over again, I found myself beating my head against the wall trying to come up with solutions (techniques) to solve some of these problems. Well, so much for the good side.

The bad side is that once solutions are found, we have a difficult time getting all this information in the issue. In the past, we solved this problem by showing projects that involved a similar technique, and presented a full article on that technique.

For the last couple of issues we've been trying something different. Most of the techniques we've used are smaller — really more like tips. And as much as we can, we've tried to include these tips right in the article for each project.

I guess what I'm getting at here is that it may be worth reading through these articles even if you're not all that interested in actually building the project. There are several good tips tucked away in this issue.

Okay, I'll make it easier. Here's a list of some of the tips:

1. How do you to make a through wedged mortise and tenon look picture perfect? Cheat a little. I used a filler plug on the ends of the mortise and tenon joints on the bunk bed. This is a whole lot easier than trying to cut a perfect mortise, and then fitting it with a perfect tenon. See Figure 25 on page 15.

2. Okay, now that the filler plug is in the mortise, how do you smooth it flush with the surface? One way is to sand 'til your blue in the face. (The filler plug is end grain, which takes forever to sand down.) Another way is to make a router jig that cleans off the end of the filler plug in no time flat. See Figure 26 on page 15.

3. How do you cut a hole in plywood without chipping and splintering the edge to pieces? Use a router instead of a sabre saw. I had to cut an access hole (for wires and cables) in the plywood back of the TV/VCR Stand. The best way to make this type of cut is with a router — I used the router table. See Figure 16 on page 11.

4. How do you cut a whole bunch of mortises without actually having to cut a whole bunch of mortises? Use a notched spacer strip. That's how we solved the problem of mounting 10 slats between the cross rails of the headboard on the bunk beds. See Figure 21 on page 14.

5. How do you get dadoes to line up perfectly (across from each other) on two pieces? Cut the dadoes before cutting the two pieces. That is, cut the dadoes in a double-wide piece first, then rip the piece down to form the two pieces with the dadoes perfectly aligned. We did this to make the uprights for the bunk bed ladder. See Figure 3 on page 19.

FINISHING. This issue begins a series of articles on finishing. This is a subject I have mixed feelings about. Most of the time I just want to get it over with — get some finish on the project and be done with it.

But that has led to disappointment more than once, and I've found myself re-finishing a project to get the look I wanted (and the project deserved).

If I've learned one thing about finishing, it's that I can't put off thinking about it until the end of the project. Finishing has to start when you're buying the wood, and continues with each step in construction.

That's the short version of the article that begins on page 20 — preparing the surface. We will be following up with articles in the coming issues on each step of the finishing process: filling, sealing, staining, plus full articles on the characteristics of varnish, shellac, polyurethane, and lacquer finishes and how to apply them. Stay tuned.

THE SCHEDULE. During the past few months we've added quite a few new subscribers. With each new subscriber, it doesn't take long before we hear two familiar questions: "Where's my issue? Why is it so late?"

Those who have been with us for awhile know that the issue always gets there, but it is late.

This problem started two years ago when we were going through a big expansion period. We slipped behind schedule — to the point that the issues were going out almost six weeks past the normal mail date. We've been trying to catch up ever since.

After two years of working seven days a week, we're still behind. What we've found ourselves doing is putting more effort into the quality of each issue. As a result, the quality has improved but the schedule has not. To solve this problem, we've outlined a new schedule that will (hopefully) allow us to catch up one week with each issue.

But we will not sacrifice quality for time. You expect good issues, on time. We will continue to produce the best we can, and try to gradually catch up so we're back on a more normal schedule.

NEXT ISSUE. The May/June issue of *Woodsmith* will be mailed during the week of June 17, 1985.

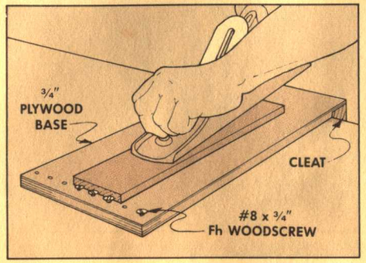
Tips & Techniques

PLANING THIN STOCK

I enjoyed building the toy truck (*Woodsmith* No. 35) for my son. It proved to be an interesting exercise in resawing and hand planing thin stock. I found it helpful to build a bench hook to do the planing.

I started with an 8″ x 18″ piece of ¾″ plywood to use as a base. Then I drilled a row of holes 1″ from one end to accept #8 x ¾″ flathead wood screws. Finally I cut a ¾″ rabbet on the opposite side and end to attach a 2″ wide by 8″ long cleat.

The bench hook rests over the edge of a bench or fits into a vise. The screws can be backed out as little as necessary to dog the thin stock. The real advantage in this bench hook is that it can hold extremely thin stock for planing without fear of the plane iron being nicked by the dogs.



Since the screwheads tend to dig into the end grain of the stock, I always allow extra length and cut off the waste.

Gene Camponeschi
Severna Park, Maryland

STOP THAT SAW

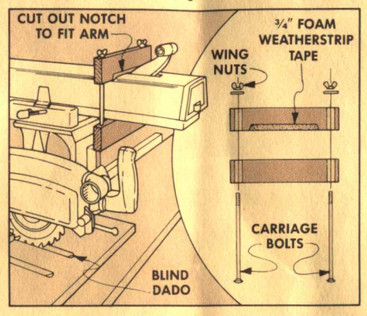
Since radial arm saws cut on the top of the wood, the blade has a tendency to grab the wood and walk right through a cut. This causes a problem if you want to make a stopped cut (such as a blind dado). It's hard to stop the saw at the correct point.

I made a fixture that fits over the arm of a radial arm saw and stops the saw at a predetermined point. It's made out of two pieces of 4/4 scrap that are 2″ wide and cut to length to accommodate the individual radial arm saw.

I cut a section out of the top piece to match the shape of the arm. Then I attached foam weatherstrip tape (¾″) to the cut-out to keep the stop from slipping and to protect the arm.

The fixture is held together with two long carriage bolts, washers, and wing nuts. A couple spins of the wing nuts and it's off or moved into position.

To use the fixture, mark the limit of the cut on one end of the workpiece. Without turning on the saw, place the workpiece



tight against the fence and bring the arm forward until it has reached the mark. Lock the saw at this point, place the fixture over the arm in front of the saw, and tighten it down. Release the saw lock and it's ready to use. As it's pulled forward, the fixture will prevent the saw from going beyond the indicated point.

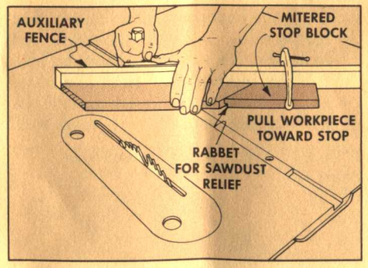
The fixture can also be placed behind the saw. In this position and with a drill chuck attached to the saw arbor, I use it as a depth stop for horizontal boring.

Joe Coughlin
League City, Texas

MITER STOP BLOCK

One problem I've had when cutting miter joints for a frame is getting the opposing side pieces to be the exact same length. If they're not the same, there will be a gap in one or more of the joints. The trick is to use a stop block.

I start by fastening an auxiliary fence to the miter gauge and cut a miter on one end



of all the frame pieces. Then I make a stop block with the same miter angle cut on one end. (If one of the scrap pieces from the initial cuts is long enough, I use it as the stop block.) I also cut a rabbet on the mitered end to act as a sawdust relief.

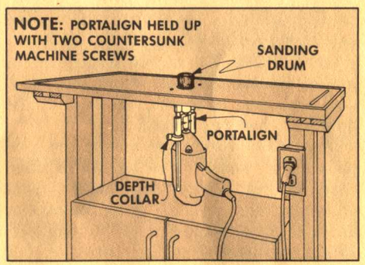
Next, I mark the final length of the piece on the auxiliary fence and clamp the stop block at this point. The workpiece is turned end-for-end and fit into the space between the auxiliary fence and the stop block. The block allows me to hold the workpiece tight and keep it from creeping toward the blade. Then the remaining pieces that are to be the same length are brought in against the block and cut.

Al Fernald
Brevard, North Carolina

SANDING ON THE ROUTER TABLE

Need a steady mount for a drum sander and don't have a drill press? That was my problem and here's how my *Woodsmith* router table proved its worth again.

I mounted a Portalign with my electric drill and sanding drum under the table. There are two holes in the base of the Portalign that accept ¼″ x 1¼″ flathead machine screws and wing nuts. I used the



base of the Portalign as a template to mark the screwholes in the top of the router table and then drilled and countersunk holes for the screws.

The depth collar on the side rod has to be removed and placed *below* the yoke to hold the drill up under the table. The collar location can be periodically adjusted if the drum wears down in one spot.

To use it, chuck the correct sanding drum in the drill, plug it in, and push the constant-on button. I find it's a comfortable height for drum sanding.

Bob Llora
Lenoir, North Carolina

SEND IN YOUR IDEAS

If you'd like to share a woodworking tip with other readers of *Woodsmith*, send your idea to: *Woodsmith*, Tips & Techniques, 2200 Grand Ave., Des Moines, Iowa 50312.

We pay a minimum of $10 for tips, and $15 or more for special techniques (that are accepted for publication). Please give a complete explanation of your idea. If a sketch is needed, send it along; we'll draw a new one.

Doll Cradle

GOODNIGHT, MRS. CABBAGE PATCH, WHEREVER YOU ARE

Usually the Christmas season ends in December. But this year, it seems to be lingering on a while longer. The most recent post-Christmas project has been a doll cradle for all the Cabbage Patch Kids "adopted" this year.

I designed the doll cradle to be a fairly simple piece, using basic joinery techniques, and requiring only a few hours to complete. I also used ponderosa pine to keep the cradle light enough that even a two-year-old can carry it around the house.

The cradle consists of five pieces: two sides and a bottom that are joined to the headboard and footboard. The first step in building the cradle is to make a template for the headboard and footboard.

THE TEMPLATE

To make the template, I started by cutting a piece of ¼"-thick Masonite 16" by 18½", see Fig. 1. Then I laid out the profile of the headboard/footboard.

CENTERLINE. The key to laying out the profile is the vertical centerline, see Fig. 1. Once this line is drawn, the rest of the profile is centered around it.

DIAGONALS. First, the sides of the template are formed by drawing two 15° diagonals, see Fig. 1. To do this, connect a point on the bottom edge, 3⅞" from the centerline to a point on the side of the template, 15½" from the bottom edge, see Fig. 1.

TOP ARC. After the sides are drawn, I marked the top arc. To do this, first locate center point A on the centerline, 3½" from the bottom edge. Then draw a 10½"-radius arc, see Fig. 2.

Shop Note: I used the simple beam compass shown in Detail A to draw this arc. This compass is just a thin strip of wood with a notch at one end to hold a pencil, and a 1/16" hole at the pivot point for a brad.

BOTTOM ARC. The bottom arc is drawn the same way: Locate center point B on the centerline 18" from the bottom edge and draw an 18"-radius arc, see Fig. 2.

RADIUS CORNERS. Once these two arcs are drawn, locate the center points for the four radius corners at the top of the template. These radii form the top of the handle and the shoulders, see Fig. 3.

After the center points are located, use a compass to draw the radius corners on the template. Then to complete the shoulder, draw a tangent line connecting the two radii on each side.

Next, follow the same procedure for the four radii near the bottom of the template to form the ends on the rocker — locate the center points and draw the radii.

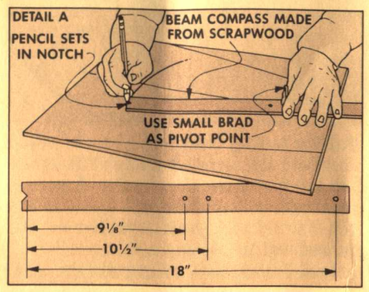
HANDLE. At this point the template is almost complete. All that remains is the handle. To lay out the handle, first find the centerline by drawing a 9⅛" radius arc from center point A, see Fig. 4. Then draw the ¾"-dia. end holes on this arc, 1⅝" from the centerline. Finally connect the top and bottom edges on the two end holes with arcs, using pivot point A.

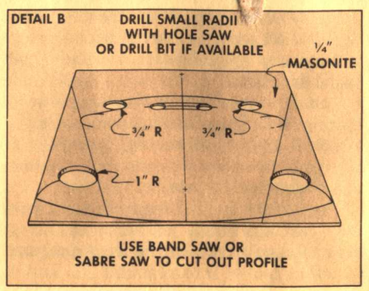
SCREW HOLES. The template is complete at this point, except for six holes that are used later to locate the screw holes for attaching the headboard and footboard to the cradle sides. To locate these holes on the template, draw a line parallel to both sides of the template, ⅞" from the edge, see Fig. 4. Then mark the position of the holes along this line, 4½", 8¾", and 10¼" from the bottom edge.

After these points are located, drill ⅛" pilot holes in the template so the location of the holes can be transferred onto the headboard and footboard.

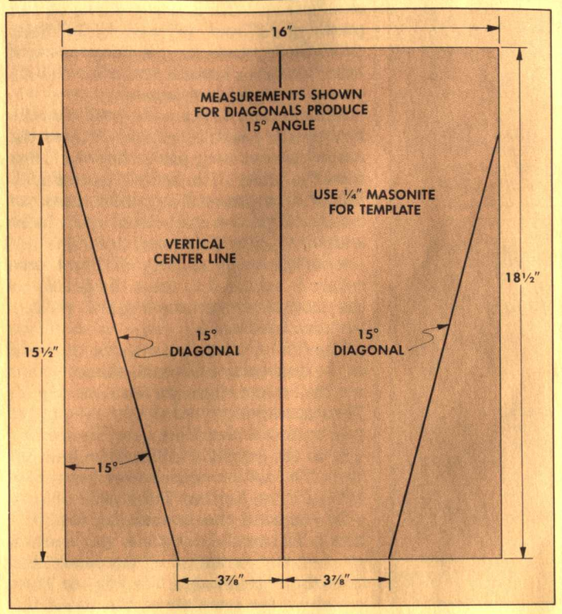
CUTTING. The last step before cutting out the profile is to bore the radius corners and handle holes with a drill bit or hole saw. Although this step is optional — depending on whether you have the right sized bits — it's an excellent way to produce perfect radius corners, see Detail B.

Once the corners are drilled out, use either a band saw or sabre saw to cut out the remaining profile. (To cut out the handle, I used a sabre saw and hand filed the edges smooth.) Then sand the edges of the template smooth with a drum sander.

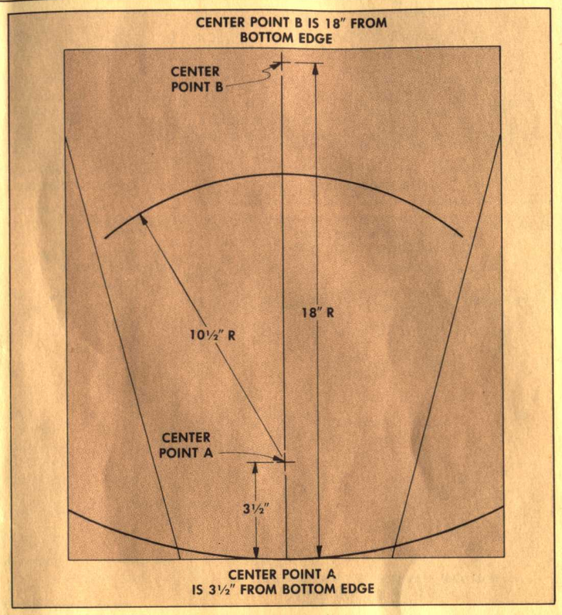




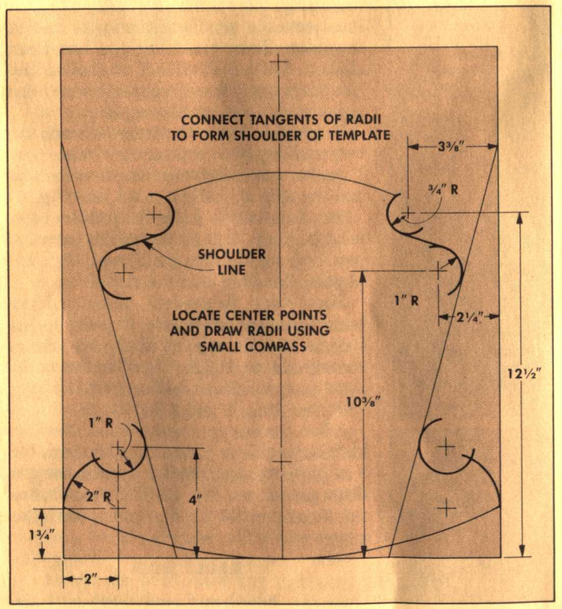
The Template



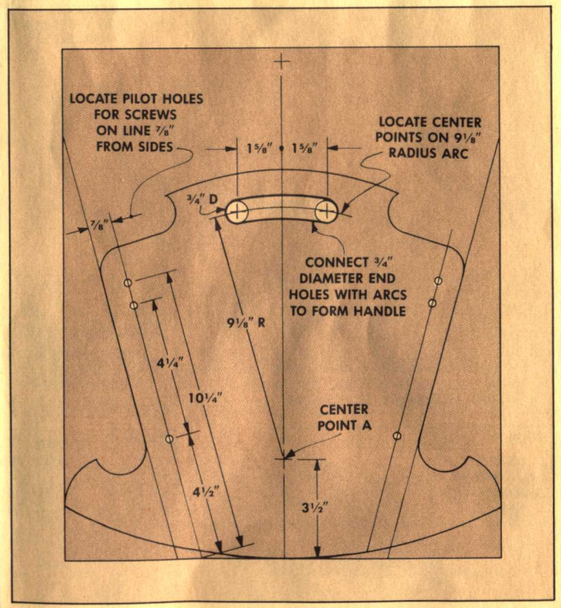
1 *Draw a center line on a piece of ¼" Masonite. Then draw the 15° diagonals, starting on the bottom edge 3⅞" from center, and ending on the outside edge 15½" from the bottom.*



2 *Locate center points A and B on the centerline. Then using a beam compass, draw the 10½" radius top arc using center point A, and the 18" radius bottom arc using center point B.*

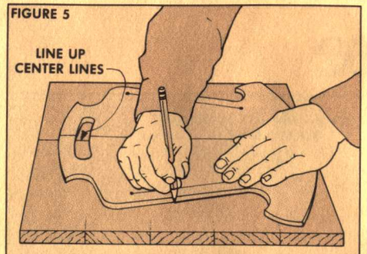


3 *Center the end holes for the handle on a 9⅛" radius arc and connect the top and bottom edges of the end holes. Then draw a line ⅞" from the sides, and locate the mounting holes.*



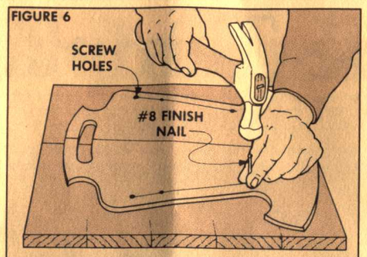
4 *Next, locate the center points for the small radii and draw the eight radii using a small compass. Then connect the tangents of the radii at the top of the template to form the shoulders.*

FIGURE 5



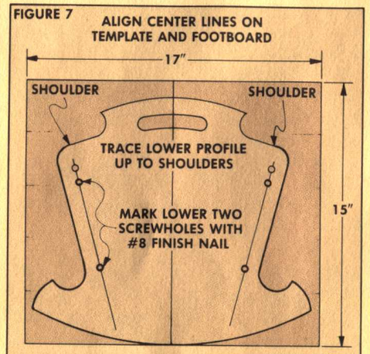
TRACE OUTLINE OF TEMPLATE ONTO HEADBOARD

FIGURE 6



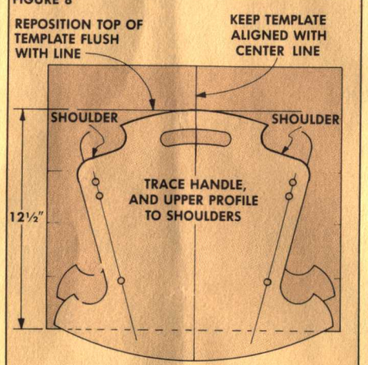
BEFORE MOVING TEMPLATE, USE #8 FINISH NAIL TO MARK TOP AND BOTTOM SCREW HOLES

FIGURE 7



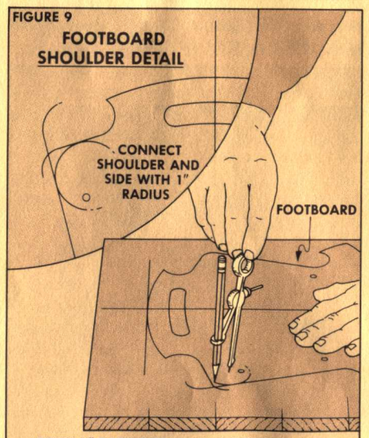
POSITION TEMPLATE ON FOOTBOARD FLUSH WITH BOTTOM EDGE

FIGURE 8



MARK A LINE 12½" FROM BOTTOM EDGE

FIGURE 9



DRAW 1" RADIUS TO CONNECT SHOULDER AND SIDE WHERE PROFILES MEET

FIGURE 10

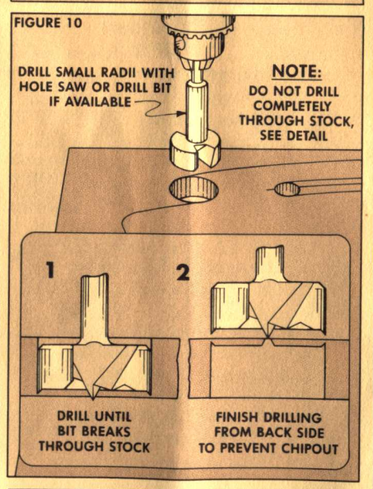


FIGURE 11

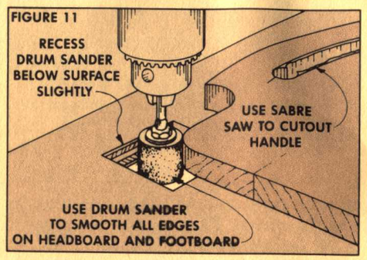
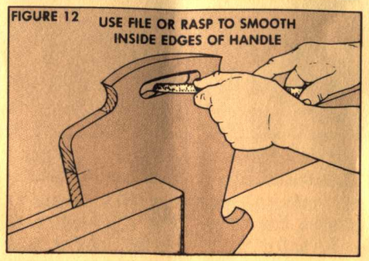


FIGURE 12



THE HEADBOARD AND FOOTBOARD

When the template is completed, the next step is to use it to build the headboard (A) and footboard (B). Start by gluing up two panels of ¾" pine, 15" wide by 17" long. After these panels are planed and sanded smooth, draw a vertical centerline on both panels to align the template.

HEADBOARD. To trace the profile on the headboard, position the template so the centerlines on both pieces line up. Then trace the outline of the template, see Fig. 5. With the template still in position, mark the location of the top and bottom screw holes with an 8-penny finish nail, see Fig. 6.

FOOTBOARD. A slightly different procedure is required to trace the profile on the footboard because it's 1½" shorter than the headboard.

The first step is to position the template on the footboard so the centerlines line up, and the bottom edges are flush, see Fig. 7. Then trace the *bottom half* of the template, only up to the shoulders near the handle.

With the template still in this position, mark the location of the lower two screw holes with an 8-penny finish nail.

To complete the pattern for the footboard, lift up the template and mark a point on the centerline of the panel 12½" from the bottom edge, see Fig. 8. Then reposition the template so the top of the handle is flush with this mark, and the centerlines on both pieces are aligned.

Now trace the top half of the profile (including the handle) down to where it intersects the profile of the lower half at shoulder. Since the template has been shifted down 1½", the 1" radius at the shoulders won't line up properly where the upper and lower profiles meet.

To produce a smooth corner between the two profiles, use a compass to draw a new 1" radius corner between the shoulder line and the side of the footboard, see Fig. 9.

DRILL CORNERS. After the profiles have been laid out, drill all the radius corners, just like on the template, see Fig. 10. (Again, this step is optional.)

Shop Note: To prevent chipout on the back side of the workpiece, stop drilling as soon as the centerpoint of the bit breaks through the back side. Then flip the workpiece over, and finish drilling from the back side, see Steps 1 and 2 in Fig. 10.

After the corners are drilled, the remaining profile is cut out on a bandsaw (or a sabre saw), and sanded smooth using a drum sander, see Fig. 11. Then use a sabre saw to cut out the handle, and smooth the edges with a file, see Fig. 12.

CRADLE SIDES

Once the headboard and footboard are completed, the next step is to cut the cradle sides and the bottom. Glue up enough ¾" pine for the two sides (C), and

the bottom (D). Then plane or sand the panels smooth and trim the sides 8" wide by 18" long.

ANGLED GROOVE. The sides of the cradle are joined to the bottom with a groove angled at 15°, see Fig. 15. (This groove is cut at an angle so the cradle sides will be parallel with the sides of the headboard and footboard, see Fig. 18.)

To cut the groove, I used a dado blade on the table saw and made several trial cuts until the width of the groove matched the thickness of the bottom. Then I adjusted the angle of the blade to 15°, and set the depth of cut to 3/16" deep, see Fig. 14. When the blade is set, adjust the fence to cut a groove ¼" from the bottom edge of the cradle sides.

After the grooves are cut, lay out the profile on the cradle sides as shown in Fig. 13. Then cut out the profile, drilling the radius corners first, and sand the profile smooth with a drum sander.

DRILL PILOT HOLES. To join the sides to the headboard and footboard, first counterbore and drill pilot holes in the headboard and footboard for #8 x 1¼" woodscrews and ½" buttons, see Fig. 16.

To drill the pilot holes on the ends of the cradle sides, draw a line centered on the ends and mark the location of the bottom holes, see Fig. 13. Measure up to the top holes using exactly the same spacing as the pilot holes on the headboard and footboard. Finally, drill 3/32" pilot holes ¾" deep in the ends of the cradle sides.

CUT BOTTOM. When the pilot holes are drilled, dry-assemble the sides to the headboard and footboard to determine the final width of the bottom. With these pieces screwed together, trace the outline of the angled grooves on the headboard and footboard. Then disassemble the pieces and measure between the grooves to determine the final width of the bottom.

ROUNDING EDGES. The last step is to round over all the edges of the headboard, footboard, and the top edges on the sides. (I used a ½" round over bit set to a depth of 5/16" to produce a softened bullnose profile, see Fig. 17.)

Shop Note: As I was routing the headboard and footboard, every time I came to one of the "points" on the profile where the grain direction made an abrupt change, the wood tended to chip out, see Fig. 18. To prevent this, you may want to stop routing just short of the "points," and round over this area by hand with a file and sandpaper.

ASSEMBLY. Finally, all the pieces are ready to assemble. Insert the bottom in the sides, but don't glue it in place. Only apply glue to the ends of the cradle sides, then attach the headboard and footboard with #8 x 1¼" woodscrews.

Finally, I finished the cradle with three coats of Tung Oil Varnish, and covered the screw holes with ½" buttons.

FIGURE 13

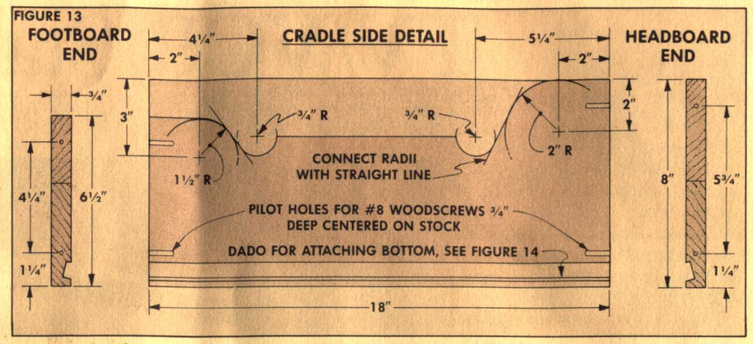


FIGURE 14

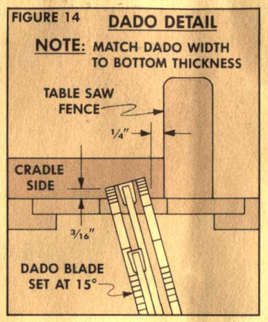


FIGURE 15

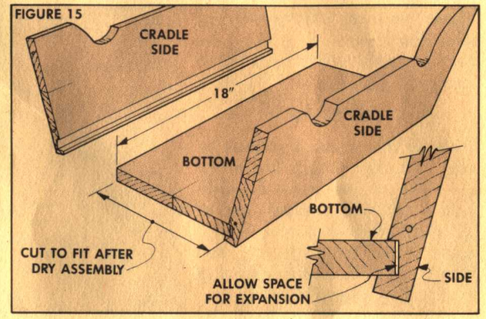


FIGURE 16

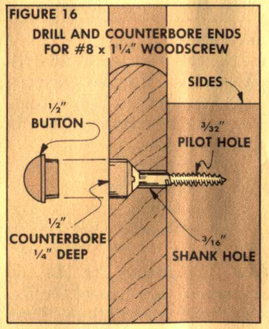


FIGURE 17

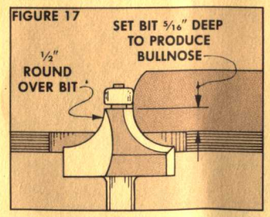
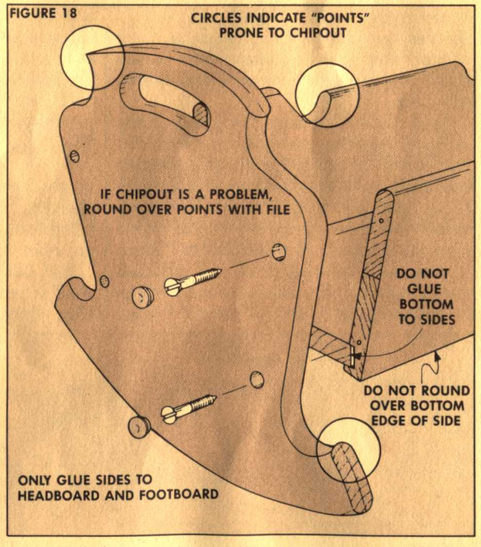


FIGURE 18

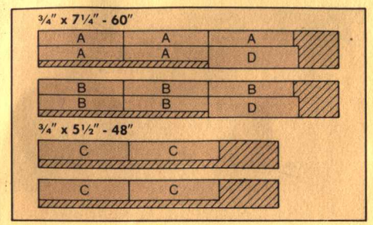


MATERIALS LIST

Overall Dimensions: 16"W x 14"H - 19½"L

A	Headboard (1) (5 piece glued-up panel)	¾ x 15 - 17
B	Footboard (1) (5 piece glued-up panel)	¾ x 15 - 17
C	Sides (2) (2 piece glued-up panel)	¾ x 8 - 18
D	Bottom (1) (2 piece glued-up panel)	¾ x 7¾ - 18

CUTTING DIAGRAM

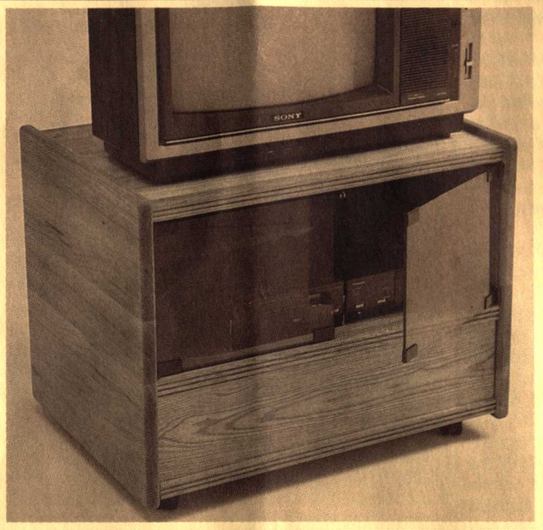


TV/VCR Stand

A STAND FOR VIDEO RECORDER AND TAPES

It used to be that everyone wanted a cabinet for stereo equipment. Now it's video equipment. In just the past year, the number of requests we've had for this type of stand has been staggering.

The stand we came up with is designed to hold a portable television, and has a compartment with glass doors for a video recorder. We also added a drawer to store video cassettes.



THE SIDES

To build this stand, I started by edge gluing enough 5/4 stock (1 1/16" thick) to get two side panels (A) with a rough size of 22" x 22". When the glue is dry, plane these panels smooth, and trim them to final dimensions of 21 3/8" x 21 3/8", see Fig. 1.

THE GROOVES. To form the basic cabinet, three plywood shelves are mounted to the sides using tongue and groove joints. This means three 1/4"-wide grooves are routed in each side piece.

Shop Note: Normally, the grain on the sides of the cabinet would run vertically. But I had to run it horizontally on this cabinet because the plywood shelves have to be glued in grooves that run the *length* of the solid-wood sides. (Solid wood expands/contracts in width, but not much in length. Plywood does not expand/contract at all. So, the plywood shelves have to run the *length* of the solid-wood sides to avoid problems.)

In addition, the grooves for the shelves are double-stopped — stopped short of both the front and back edges. Before routing the grooves, I marked the stop lines on the cabinet sides, see Fig. 1.

Note: The grooves stop at different points because of the alignment of the shelves, the edging strips, and the plywood back. To get an idea of what's going on, refer to Figure 2.

TOP GROOVE. The groove for the top shelf is positioned 3/4" down from the top edge of the side panel, and stops 1 1/4" from both the front edge and the back edge, see Fig. 1.

MIDDLE GROOVE. The middle groove is positioned 8 7/8" from the bottom edge. This groove also stops 1 1/4" from the front edge (to align with the top groove). But it extends a little closer to the back edge (stopping 5/8" from the back edge) to align with the cabinet's plywood back, see Fig. 2.

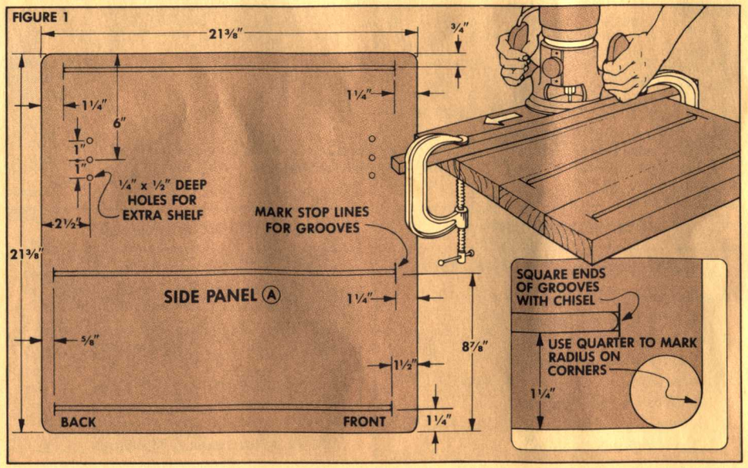
BOTTOM GROOVE. The bottom groove is positioned 1 1/4" from the bottom edge. This groove stops 5/8" from the back edge, the same as the middle groove. However, since the bottom shelf doesn't have a tongue or an edging strip, this groove stops 1/4" farther back than the top two grooves, see Fig. 2.

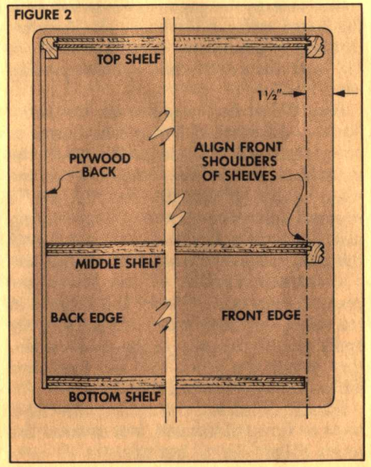
ROUT GROOVES. After the stop lines are marked, clamp a fence in position, see Fig. 1. Then rout a 1/4"-wide groove between the lines starting each pass with a plunge cut.

SQUARE ENDS. After the grooves were routed, I used a chisel to chop the ends of the grooves square at the stop lines, see Detail in Fig. 1. (This helps align the shelves during the glue-up phase.)

HOLES FOR SHELF. As an option, a glass shelf can also be added above the video recorder. To do this drill three 1/4"-dia. holes 1/2" deep in the cabinet sides for pin-style shelf supports, see Fig. 1.

ROUND EDGES. To complete the sides, I rounded the corners to a 1/2" radius, and the edges with a 3/8" round-over bit.





THE SHELVES

Now the three shelves can be cut to rough size out of 3/4" oak-veneer plywood. (In order to get all three shelves out of a 4' x 4' piece of plywood, I had to cut the bottom shelf with the grain running from front to back, see Fig. 3.)

CUT SHELVES TO SIZE. After cutting the shelves to rough size, cut them to a final width of 28 1/4". Then cut each shelf to the same length as the corresponding groove in the cabinet sides, see Fig. 3.

EDGING STRIPS

Before mounting the shelves to the cabinet sides, I cut three edging strips (E) for the top and middle shelves from 5/4 stock, 1 1/4" wide and to rough length of 29".

GROOVES. These strips are joined to the plywood shelves with tongue and groove joints, see Fig. 3. To do this, rout a 1/4"-wide groove in each strip, 1/4" down from the top edge, see Fig. 4.

Shop Note: I routed these grooves on the router table so they would match the grooves in the cabinet sides. This way the tongues can be cut exactly the same on all edges of the shelves.

VEINING. Next, rout two 3/16"-wide decorative veining grooves on the two strips that go on the front edges of the top and middle shelves, see Fig. 5.

ROUND EDGES. Then to complete the two front strips, round the top and bottom edges, see Fig. 6. As for the strip that goes on the back edge of the top shelf, cut a 1/4" x 1/2" rabbet for the plywood back, and round over the top edge, see Fig. 3.

TONGUES ON SHELVES

When the edging strips were complete, I went back to work on the shelves. All three shelves have tongues on the two edges that join to the cabinet sides, refer to Fig. 3. The top and middle shelves also have tongues for the edging strips.

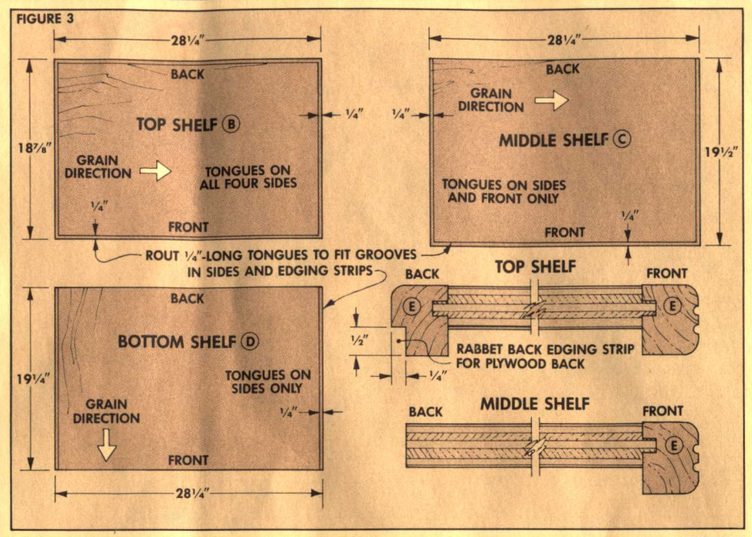
CUT TONGUES. I cut these tongues on the router table, see Fig. 7. Set the fence and cut two 1/4"-wide rabbets, leaving a tongue that fits snugly in the grooves.

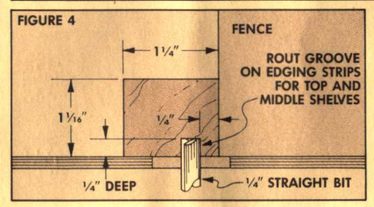
Shop Note: As the cuts for the tongues are set up, make sure the tongues are positioned so the top edge of the edging strip is just slightly above the surface of the plywood. Then the solid-wood edging can be sanded down flush with the plywood.

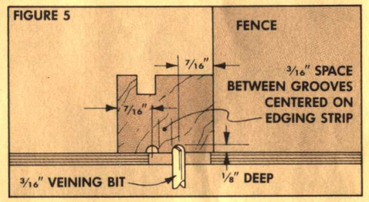
ASSEMBLE THE CABINET

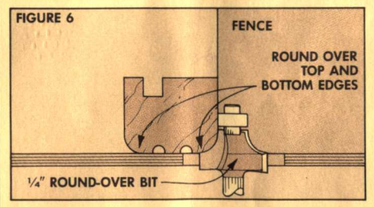
After the tongues are cut, dry-assemble the cabinet to make sure the shelves line up as shown in Fig. 2. If all fits well, glue and clamp the shelves to the cabinet sides.

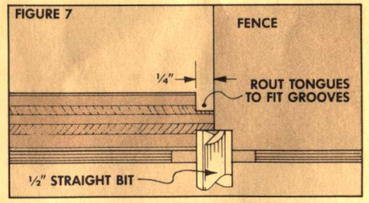
When the glue is dry on this assembly, cut the edging strips to final size (to fit tight between the cabinet sides), and then glue and clamp them to the tongues on the shelves, see Fig. 8.

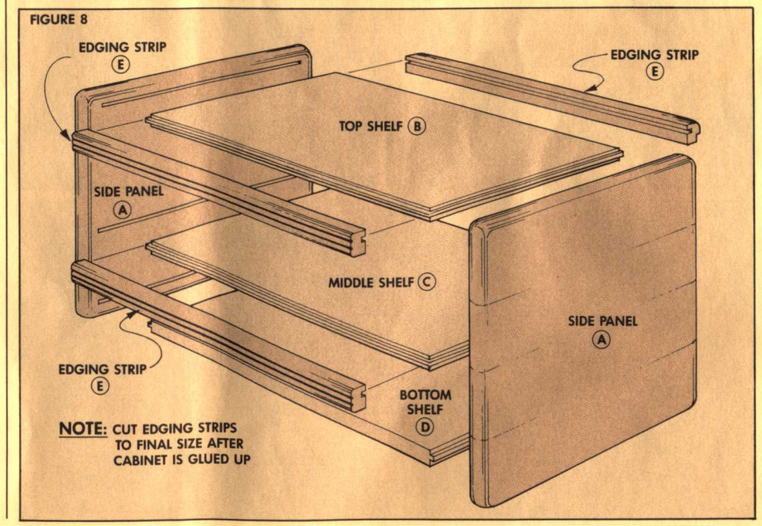


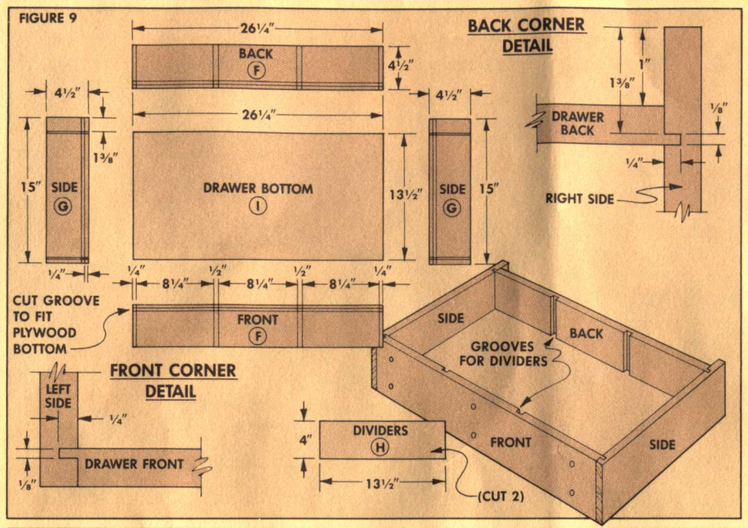


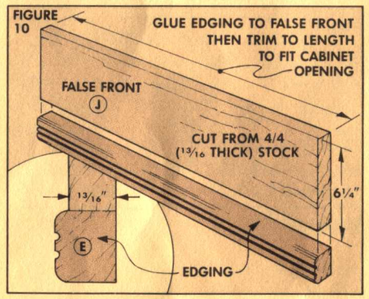


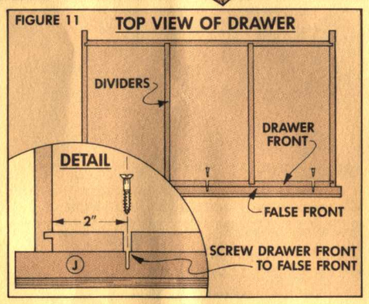


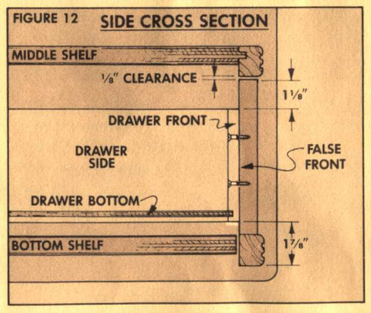


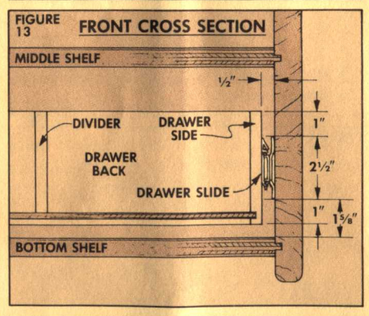


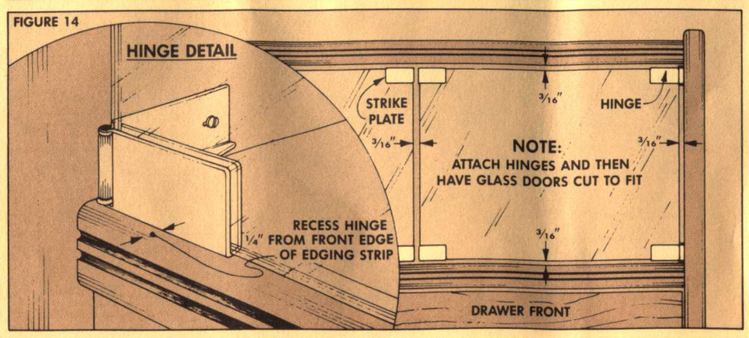












THE DRAWER

After the cabinet is assembled, the drawer can be added. Here I should mention a few things about the size of the drawer. When designing this project, I actually started with the dimensions of the drawer — making it wide enough to hold three rows of video tapes. Then I built the cabinet so the *inside* width accommodated a drawer with these measurements.

CUT PIECES TO SIZE. This drawer is constructed using ½" stock for all four sides. Then later a false front is added. To start, rip the pieces for the front, back and sides to a common width of 4½", see Fig. 9. Then cut the sides (G) to a length of 15".

The critical measurement is the length of the front and back pieces (F). Measure the distance between the cabinet sides and subtract 1" for the drawer slides. (The drawer slides I used require a ½" space on each side.) Then subtract the thickness of the drawer's two side pieces (1" total), and *add* ½" for the ¼"-long tongues on the ends of the front and back pieces.

JOINERY. After the four pieces are cut to size, they're joined with tongue and dado joints. To cut these joints, first cut ⅛"-wide dadoes on the ends of the side pieces, see the Front and Back Corner Details in Fig. 9. Then cut rabbets on the ends of the front and back pieces, leaving tongues that fit the dadoes.

GROOVE FOR BOTTOM. After the joint cuts are complete, cut a groove ¼" from the bottom edge of each piece for the plywood bottom.

DIVIDERS. Also, cut ½"-wide dadoes on the inside faces of the front and back pieces for the two dividers (H). Dry-assemble the drawer to get the measurements for the dividers, and cut them to size to fit between the grooves.

ASSEMBLY. Before final assembly, drill six counter-sunk pilot holes in the drawer front for the screws that hold the false front to the drawer, see Fig. 11. Then the drawer can be glued and clamped together.

FALSE FRONT. Now the false front (J) is added. This front is cut to rough length from 4/4 stock, about 1" longer than the opening in the cabinet. Then rip it to width to equal the distance from the top of the bottom shelf to the bottom of the edging strip on the middle shelf, less ⅛" for clearance, refer to Fig. 12.

EDGING STRIP. Next, cut the edging strip (E) that goes on the bottom edge of the false front. This strip is cut 1¼" wide from 5/4 stock, see Fig. 10. Then rout two 3/16" veining cuts on the face side, and the top and bottom edges are rounded with a ¼" round-over bit, refer to Figs. 5 and 6.

After the molding cuts are made on this piece, glue and clamp it to the bottom edge of the drawer front. When the glue is dry, cut the drawer front to final length to fit between the cabinet sides, less a total of ⅛" for clearance.

DRAWER SLIDES. Before mounting the false front to the drawer, first mount the drawer slides, see Fig. 13. Then attach the false front to the drawer with No. 6 x 1" woodscrews.

THE GLASS DOORS

If you have a video recorder with a wireless remote control, only glass doors will allow the remote control to operate while the doors are closed. To determine the size of the glass for the doors, first order and mount the hinges (see Sources, page 24) to verify the clearances.

Mount the hinges to the cabinet side so they're set back ¼" from the face of the edging strip and ⅛" above the shelf, see Detail in Fig. 14. Then have the glass cut to size.

TOUCH LATCH. To complete the doors, I mounted a double magnetic touch latch. This is a clever piece of hardware that let's you open and close the doors without a handle, see Sources, pg. 24. In order to mount the latch, glue a spacer block to the underside of the top shelf, see Fig. 17. Then screw the touch latch to this block.

THE BACK

Normally when building a cabinet, one of the last steps is cutting the back to size. Although that's true with this cabinet, there's one other step for this back — cutting an access hole to feed wires and cables to the video recorder.

CUT TO SIZE. Start by cutting the ¼" plywood back (K) to fit the back of the cabinet, see Fig. 15. Then the access hole is cut for the wires. To do this, mark the boundaries of the access hole so it's in line with the back of the video recorder.

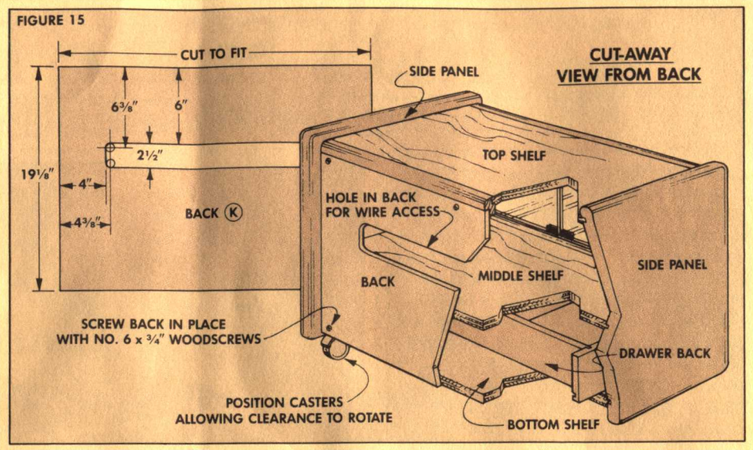
To cut this hole, I started by drilling ¾"-dia. holes at each corner. To complete the hole, a sabre saw could be used, but the edges would come out pretty splintered and chewed up.

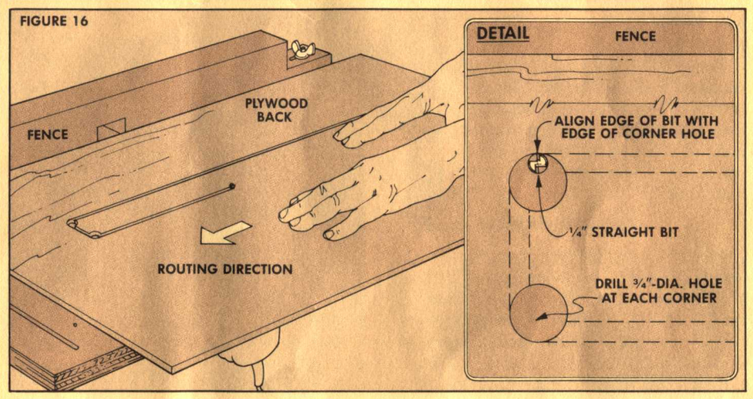
Instead, I cut it out on the router table. (A router with ¼" straight bit produces a smooth, clean cut on plywood.) Adjust the fence on the router table so the bit just barely skims the edge of the ¾"-dia. corner hole, see Detail in Fig. 16.

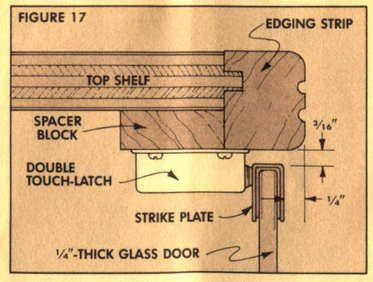
When the fence is set, lift up the plywood back, turn on the router, and slowly plunge the plywood back onto the bit and rout to the other corner hole. Repeat this procedure for all four sides to get an access hole with perfectly smooth edges.

When the access hole is complete, screw the back in place with No. 6 x ¾" woodscrews. I also mounted four 2" swivel casters to the bottom shelf.

FINISHING. To finish the cabinet, I gave all surfaces a final sanding with 180-grit sandpaper and then applied two coats of tung oil varnish.





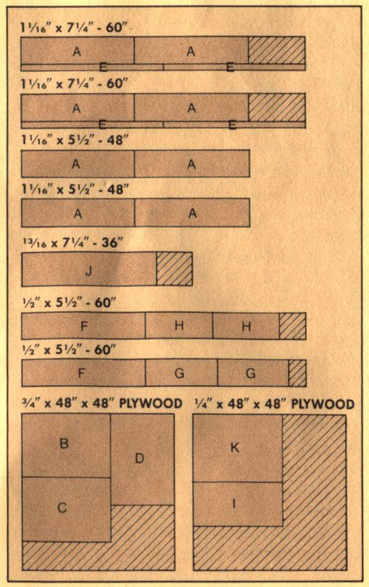


MATERIALS LIST

Overall Dimensions: 21⅜"h x 29⅞"w x 21⅜"d

A	Sides (2)	1 1/16" x 21⅜ - 21⅜
B	Top Shelf (1)	¾ x 18⅞ - 28¼
C	Middle Shelf (1)	¾ x 19½ - 28¼
D	Bottom Shelf (1)	¾ x 19¼ - 28¼
E	Edging Strips (4)	1 1/16 x 1¼ - 27¾
F	Drawer Frnt/Back (2)	½ x 4½ - 26¼
G	Drawer Sides (2)	½ x 4½ - 15
H	Drawer Dividers (2)	½ x 4 - 13½
I	Drawer Bottom (1)	¼ x 13½ - 26¼
J	False Drawer Frnt.	13/16 x 6¼ - 27⅝
K	Back	¼ x 19⅛ - 27¾

CUTTING DIAGRAM



Kid's Single Bed

THIS ONE IS A REAL SLEEPER

As soon as I finished building the bunk bed shown on the cover, we gathered together some of the *Woodsmith* kids and asked them for an expert opinion. The reaction was unanimous — eyes opened with delight at the sight of what looked like a jungle gym rather than a place to sleep.

In fact, Katie (Ted's three-year-old) was having so much fun exploring the heights of the top bunk, that when it was time to go she exclaimed, "No, I want to stay — I'll take a nap on this bed, okay?" Ted's jaw dropped, and he decided the bed was worth any amount of time and money to build.

The single bed shown at right is designed so it can be used alone, or two of them can be stacked to form a bunk bed. Whether you're building one bed or two, the construction procedure starts out the same.

THE UPRIGHTS

I started by cutting the uprights for the headboard and footboard out of 5/4 oak (1 1/16" thick actual). The two uprights (A) for the headboard are 4" wide by 34" long, and the uprights (B) for the footboard are 4" wide by 28" high, see Fig. 1.

MORTISES. After the uprights are cut to size, through mortises are cut for the cross rails. These mortises are made by drilling a series of ½"-dia. holes, centered on the width of the uprights, see Fig. 2.

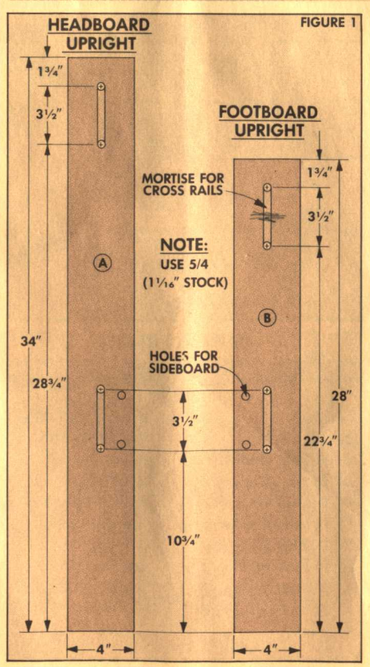
To form the bottom mortises on all four uprights, mark a ½"-dia. hole centered 10¾" up from the bottom end of the upright, see Fig. 1. Then mark a second hole centered 3½" up from the first.

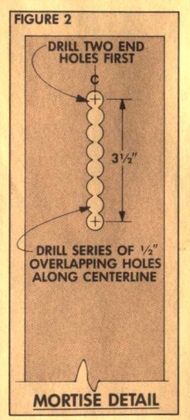
Drill these two holes and continue with a series of overlapping holes to form the mortise, see Fig. 2. (I used a Forstner bit here because it will drill overlapping holes without sliding off course.)

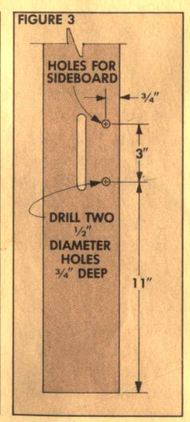
For the top mortises, measure up 28¾" on the headboard upright (A), and 22¾" on the footboard upright (B) for the first holes. Then drill the second holes centered 3½" up from the first holes, see Fig. 1.

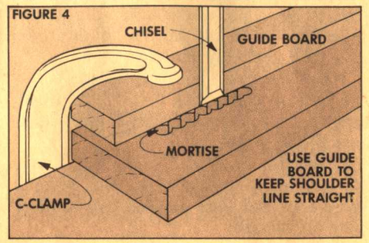
CLEAN UP MORTISE. To clean up the cheeks of the mortises, I clamped a guide board along the edge of the holes to guide the chisel, see Fig. 4. To get the cleanest edge on both sides, I chopped only halfway down, and then flipped the piece over to clean out the mortise from the back side.

DRILL HOLES FOR SIDE BOARD. The last step on all four uprights is to drill two ½"-dia. holes next to the bottom mortises,









38+3 = 38 + 1½ + 1 = 40½ + 1½ = 42"

see Fig. 3. Although these holes aren't used until later (to join the bed's side boards between the headboard and footboard, refer to Fig. 29), I drilled them now while it's easy to get to this area.

THE RAILS

Next, the uprights are joined together with two cross rails (C). These rails are 5" wide and their length is determined by two things: 1) the width of the mattress, and 2) the length of the tenons.

It's best to get a measurement from the mattress you're going to use. (The Sears mattress I used is 37½" wide.) Measure the width of the mattress and add 3" to get the *shoulder-to-shoulder* length of the rails, see Fig. 6. (The additional 3" allows for the two side boards plus a little clearance for the mattress.)

Now add the length of the two tenons. Since the mortises go all the way through the uprights, the tenons would normally be cut long enough to also go all the way through. But I decided to cut the tenons ¼" short — to leave room for a filler plug, refer to Fig. 25. (This is an easy way to get a perfect fit on the end of the tenon that shows through the mortise.)

CUT THE RAIL. Now the rail can be cut to final length, see Fig. 5. Then cut tenons on both ends to fit snugly in the mortises, see Fig. 7. (Refer to *Woodsmith* No. 26 for a step-by-step article on cutting a mortise and tenon.)

THE SLATS

Before joining the cross rails to the uprights, the slats have to be cut. To make the 10 slats (D) for the headboard, start with five pieces of 5/4 stock 2" wide by 16" long, see Fig. 8. The 10 slats (E) for the footboard can be cut from three pieces of 5/4 stock 2" wide by 16" long.

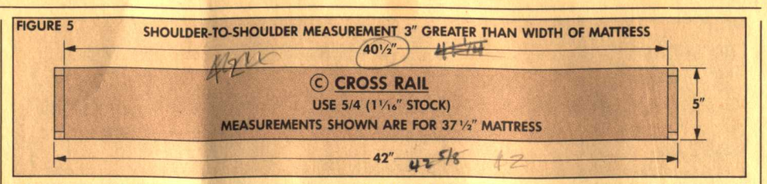
RESAW SLATS. Now, resaw these pieces in half (see Fig. 9), and then set the fence to resaw the halved pieces to a final thickness of ⅜", see Fig. 10.

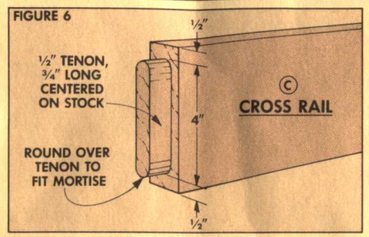
GROOVES IN RAILS

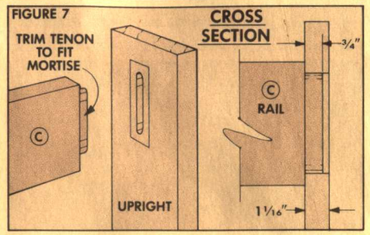
The slats would normally be mounted to the rails by cutting a whole series of individual mortises. But there's an easier way. I used a notched spacer strip that's set into a groove on the edge of the rails, refer to Fig. 21. This, in effect, produces a series of mortises — the easy way.

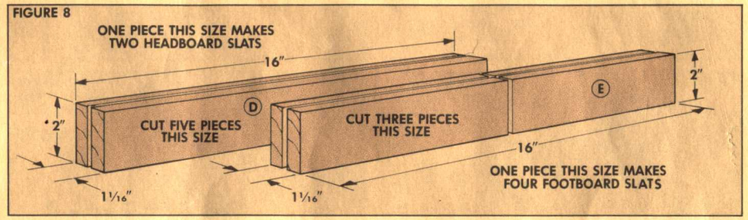
CUT CENTERED GROOVE. To mount this spacer strip, grooves are cut centered on the edges of the rails, see Fig. 12. To do this, set the fence so the blade is near the center of the stock, and make a pass, see Step 1 in Fig. 13.

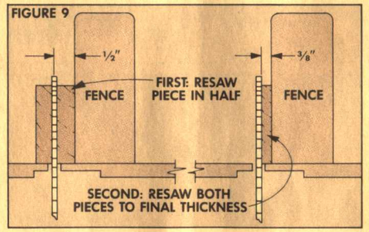
Now flip the rail around so the other face is against the fence and make another pass, see Step 2. Nudge the fence away from the blade and repeat this process (Steps 3 and 4) until the groove is wide enough for the slats, see Fig. 14.

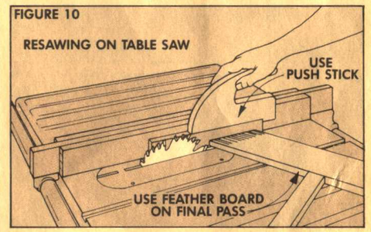


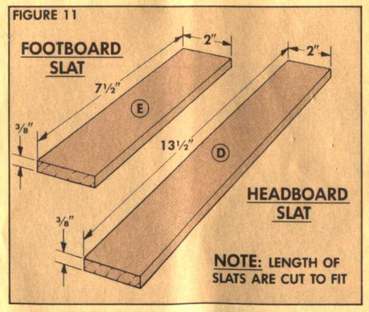


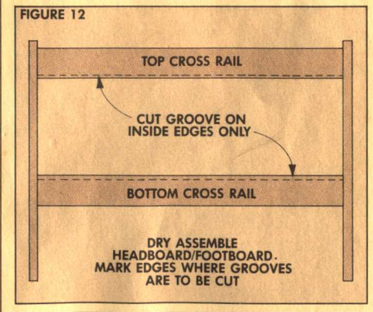


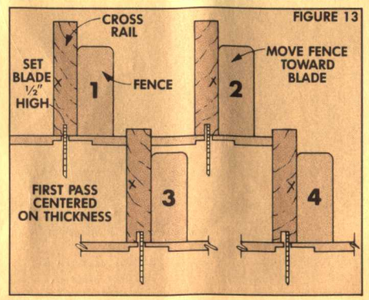


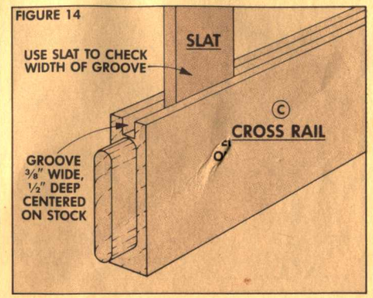


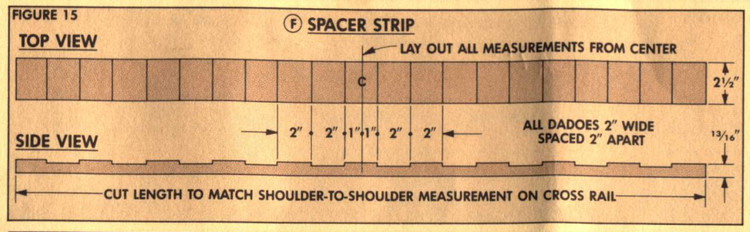


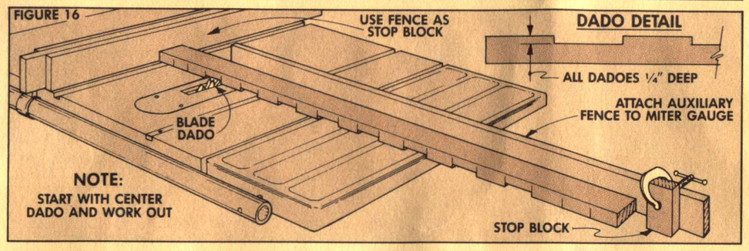


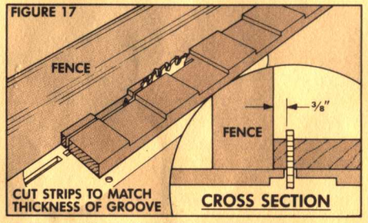


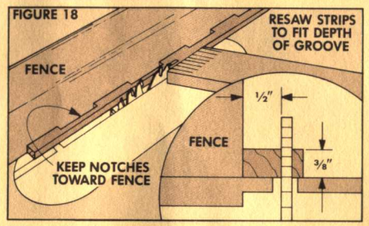


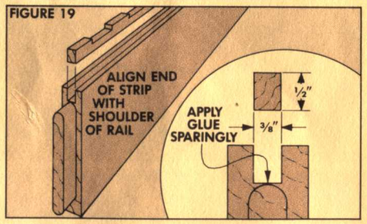


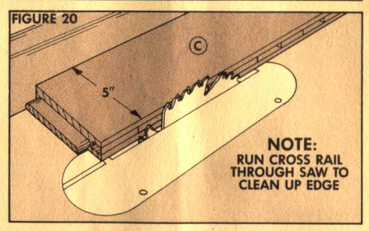


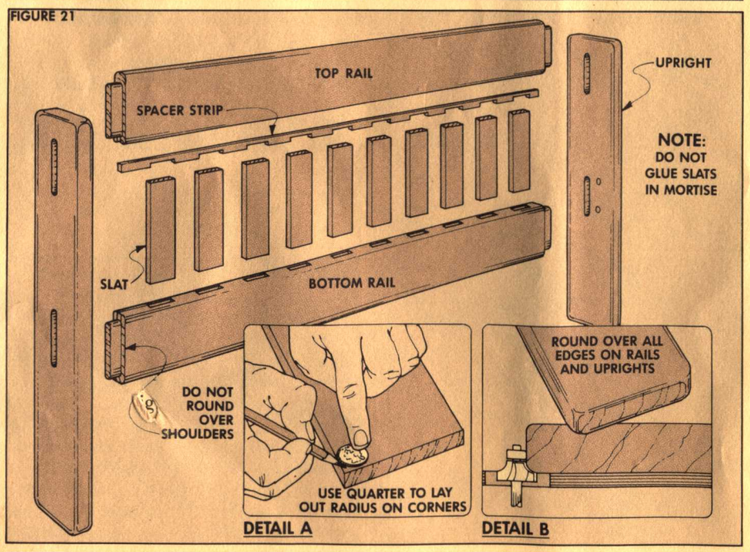












SPACER STRIPS

To complete the headboard and footboard, the notched spacer strips (F) have to be cut to hold the slats.

MARK DADOES. To make these notched strips, start with a piece of 4/4 stock 2½" wide and trimmed to length to match the shoulder-to-shoulder length of the cross rails (C), see Fig. 21

Now mark the boundaries of the 2"-wide dadoes along this piece, starting at the center and working towards the ends, see Fig. 15. (Work from the center out to get even spacing at the ends, no matter how wide the mattress is.)

CUT DADOES. After marking the position of all the dadoes, I started to cut them. Unfortunately, I found that the workpiece had a tendency to slide as the cut was being made. To prevent this, I attached a fence to the miter gauge. Then clamped a stop to one end and used the rip fence at the other end to define the limits of the dado, see Fig. 16.

Shop Note: Since the dadoes are spaced equally from the center out, cut one of the center dadoes first, then flip the board around to cut the dado on the other side of the center line.

CUT SPACER STRIPS. When all the dadoes are cut, rip this piece to form the four spacer strips, see Fig. 17. Rip each strip to width to fit snugly in the grooves in the cross rails. Then resaw them to size (Fig. 18) so the top edge of the strip is flush with the edge of the rail.

When the strips fit the grooves, glue them in place. (Avoid using too much glue — it might seep into the "mortises.") When the glue is dry, run the rail through the saw to trim the tops of the spacer flush with the rail, see Fig. 20.

ROUND EDGES AND ASSEMBLE

The last step before assembling the headboard and footboard is to round the corners and edges of the uprights and rails.

ROUND EDGES. First, round the corners of the uprights to a ½" radius. I used a quarter to mark the radius, see Detail A in Fig. 21. Next, all the edges are rounded with a ¼" round-over bit on the router table, see Detail B in Fig. 21.

Before assembly, finish-sand all the pieces — especially the slats. Also, screw threaded inserts in the top holes near the bottom rail, refer to Fig. 29. (See *Woodsmith* No. 30 for a good technique for installing inserts using a drill press.)

ASSEMBLY. Now dry-assemble the uprights and rails to get the final length for the slats. After the slats are cut to length, mount them between the "mortises" on the edges of the rails. (Don't use any glue here, just let the slats "float" in the mortises.) Then glue and clamp the mortise and tenon joints (the uprights and rails) together.

MORTISE PLUGS

As I mentioned earlier, I cut the tenons on the cross rails ¼" short to allow for decorative filler plugs at the ends of the mortises. (It's a lot easier to cut these plugs to fit the mortise perfectly than it is to cut the tenon to fit.)

To make these plugs, rip a piece of oak into three strips, see Fig. 22. Then I cut two strips of walnut to simulate the ends of wedges (to make the joint look like a wedged mortise and tenon joint).

Laminate these five pieces together, and when the glue is dry, resaw this piece to match the width of the mortise (½"). Then rip it to size to match the height of the mortise, refer to Fig. 23.

Now here's where all this work pays off. Round the edges of this filler plug on the router table with a ¼" round-over bit, see Fig. 24. This will make a perfect fit with the drilled end holes of the mortise.

MOUNT PLUG. Cut off ⅜"-long slices of the laminated strip and glue them into the mortises. Then there's one more trick. To smooth the plug flush with the face of the upright, cut a Masonite base for the router and glue two ¼"-thick Masonite spacer pads to the base, see Fig. 26.

Mount a ¼" straight bit in the router and set the depth to cut flush with the spacer pads. Now the ends of the plugs can easily be routed flush with the face of the uprights.

THE SIDE BOARDS

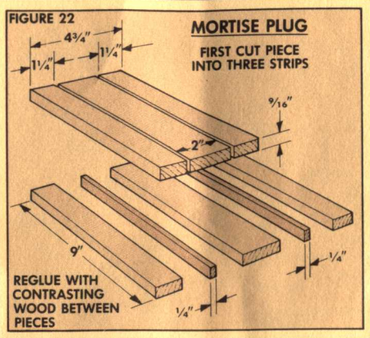
At this point the headboard and footboard are complete. All that's needed are the side boards (G) that run the length of the bed. The side boards are 5" wide and cut to length so they're 1" longer than the length of the mattress, see Fig. 27.

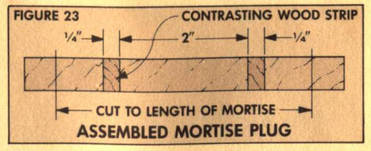
DRILL HOLES. After the side boards are cut to size, holes are drilled at both ends for the bolt and dowel pin that are used to join them to the headboard and footboard. (Note: When locating these holes, what you want is for the holes in the side boards to match up with the holes already drilled in the uprights, refer to Fig. 29.)

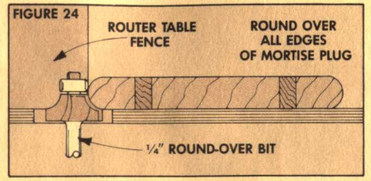
DRILL HOLES. After locating the centerpoints of these holes on the outside face of the side board, I drilled them by starting with the counterbore on the top hole on the *inside* face, see Step 1 in Fig. 28. Then flip the side board over and drill a 5/16" shank hole, using the centerpoint marked on the *outside* face, see Step 2.

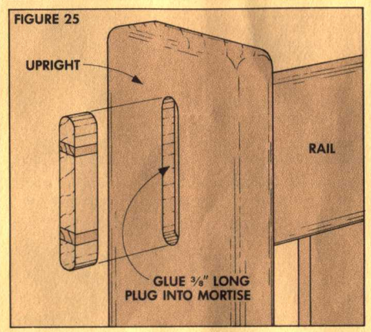
Also, drill a stopped ½"-dia. hole for a dowel pin on the outside face, see Step 3. To complete the side board, round three edges with a ¼" round-over bit as shown in Step 4.

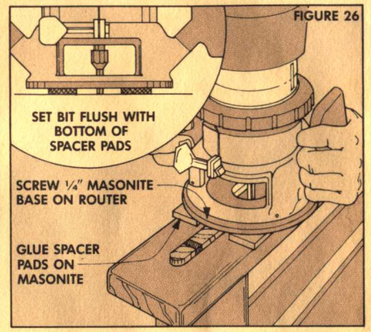
ASSEMBLY. Finally, glue a ½" dowel in the hole in the upright and test the assembly of the side boards to the uprights by screwing a 5/16" x 1¼" hex head bolt into the threaded insert, see Fig. 29.

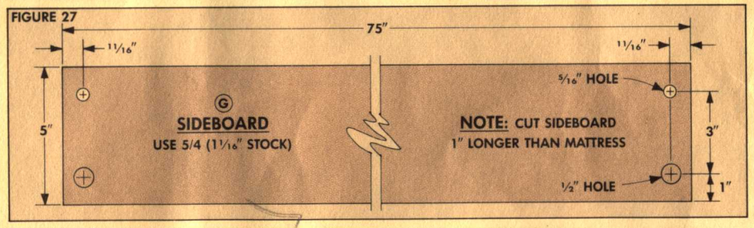


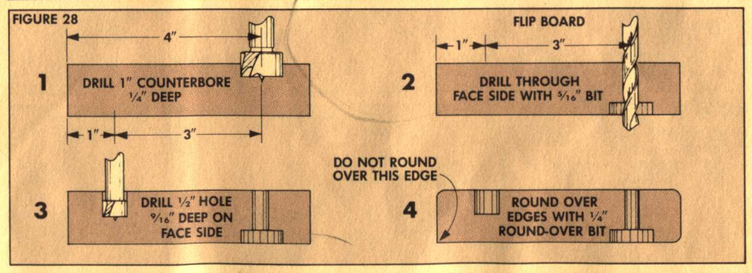


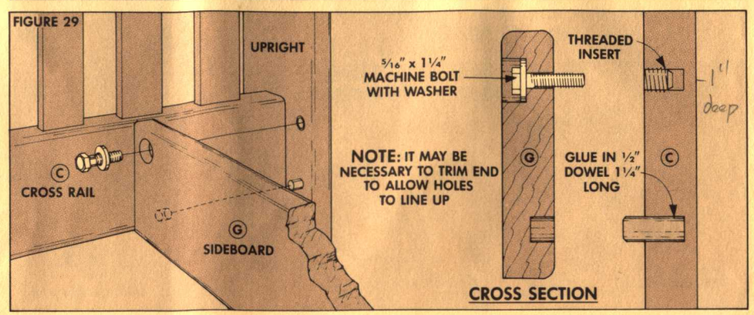


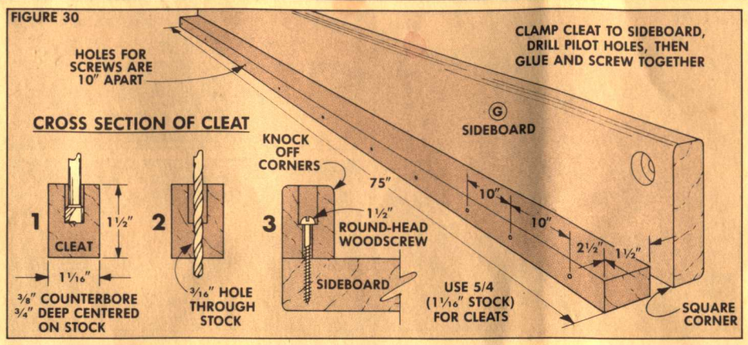


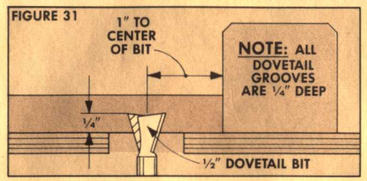


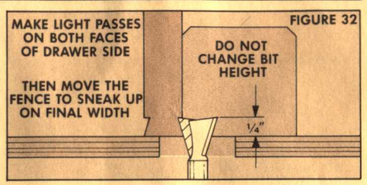


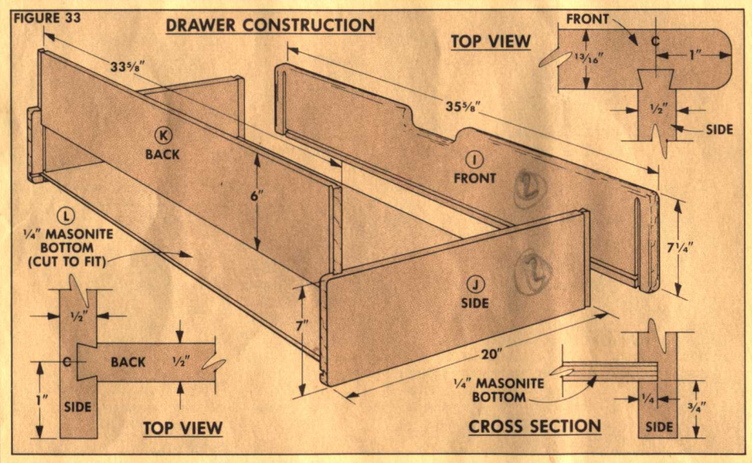


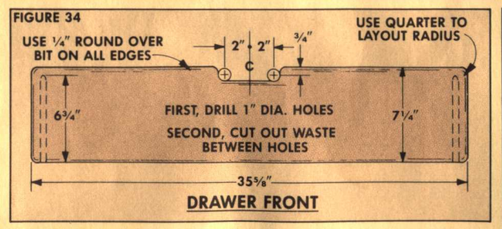


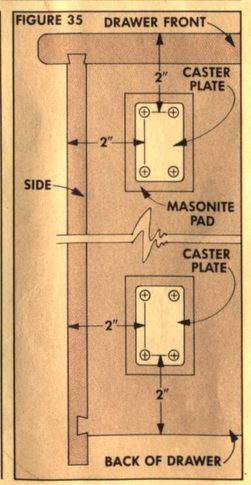


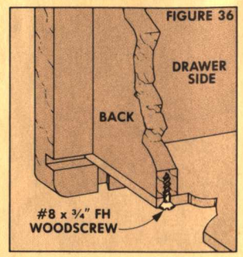


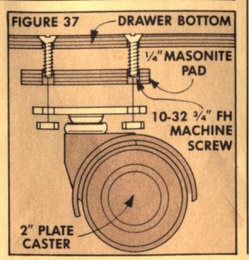












THE CLEATS

The last step on the side boards is to mount a cleat (H) to the bottom edge to support the mattressboard and mattress.

THE CLEAT. This cleat is made by ripping a piece of 5/4 stock 1½" wide and to length to match the side board. Then mount the cleats by counterboring a ⅜"-dia. hole, followed by a 3/16"-dia. shank hole (all the way through), see Cross Section in Fig. 30.

Now clamp the cleat to the side board so it's flush with the bottom edge and drill pilot holes in the side board. Finally, unclamp the cleat, apply glue to the edge, and screw it in place.

ASSEMBLY. At this point, the bed is complete. I gave it a final sanding and finished it with two coats of tung oil varnish. When the finish is dry, it's just a matter of bolting the side boards to the uprights and putting the mattressboard and mattress in place.

THE DRAWER

After the bed was done, I thought it would be handy to add two large roll-out storage drawers. These drawers are designed so they can be built and added whenever you have time. Note: The dimensions given here are for a drawer (with 2" casters) that fits an opening 10" high — the space between the bottom edge of the side board and the floor, see Fig. 41.

DRAWER FRONTS. Start by cutting the drawer fronts to size. The width (height) of the drawer front is 7¼". The length is figured by measuring between the headboard and footboard uprights and subtracting a total of ¾". (This allows ¼" between the two drawers, and ¼" at each end.) Then divide this difference by 2 to get the length of each drawer front.

THE SIDES. Next, cut the drawer sides to a width of 7", see Fig. 33. (They're ¼" shorter than the top of the drawer front.) The length of the drawer sides is optional — I cut them 20" long.

JOINERY. I assembled these drawers with dovetail tongue and groove joints. (These joints are easier to cut than they sound. See the step-by-step article in *Woodsmith* No. 31.)

DOVETAIL GROOVES. First, set up the router table with a ½" dovetail bit centered 1" from the fence, see Fig. 31. Then rout ¼"-deep dovetail grooves at both ends of the drawer front, stopping these grooves 6¾" from the bottom edge, see Fig. 34.

With the router table still set up this way, also rout dovetail grooves on the inside faces of the drawer sides for the drawer back, see Detail B in Fig. 33.

DOVETAIL TONGUES. After the grooves are cut, adjust the fence on the router table (but don't change the height of the bit) to rout dovetail tongues on the side pieces, see Fig. 32. Then trim the top end of the tongues to fit the stopped grooves in the drawer front.

After the tongues are cut, dry-assemble the sides to the front and measure to get the final length for the drawer back. Cut the back to length and then cut dovetail tongues on both ends to fit the grooves in the drawer sides.

GROOVE FOR BOTTOM. Finally, switch to a ¼" straight bit to rout grooves ¾" from the bottom edge of the drawer front and sides for the ¼" Masonite bottom.

HANDLE ON FRONT. Before final assembly, complete the drawer front by cutting out the handle pull on the top edge, see Fig. 34. Then round the four corners of the front to a ½" radius and round the edges with a ¼" round-over bit.

CASTERS. Now the drawers can be glued and clamped together. After they're assembled, I mounted four casters to each drawer, see Fig. 37. Since the drawer bottom is only ¼" thick, I added ¼" spacer pads and then mounted the casters with ¾" machine screws, see Fig. 37.

DRAWER GUIDE RAILS

The guide system for these drawers is fairly simple: since the drawers are on casters, the guide rails just act as "bumpers" to guide the drawer as it's pulled in and out.

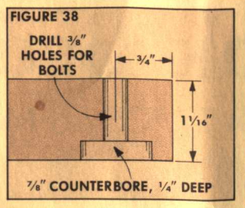
I cut the guide rails out of 5/4 stock 1¾" wide and mounted them to the bottom of the cleats on the side boards, see Fig. 39. (Instead of mounting them permanently, I used threaded inserts so they could be easily removed if the bed was taken apart.)

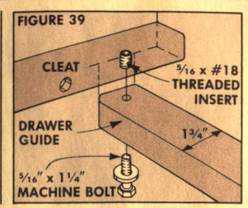
Position the middle guide rail so it's centered on the length of the bed. Then position the two outside rails so they allow for the width of the drawer plus ⅛" clearance, see Fig. 41.

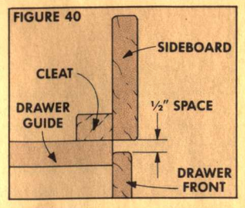
MATERIALS LIST

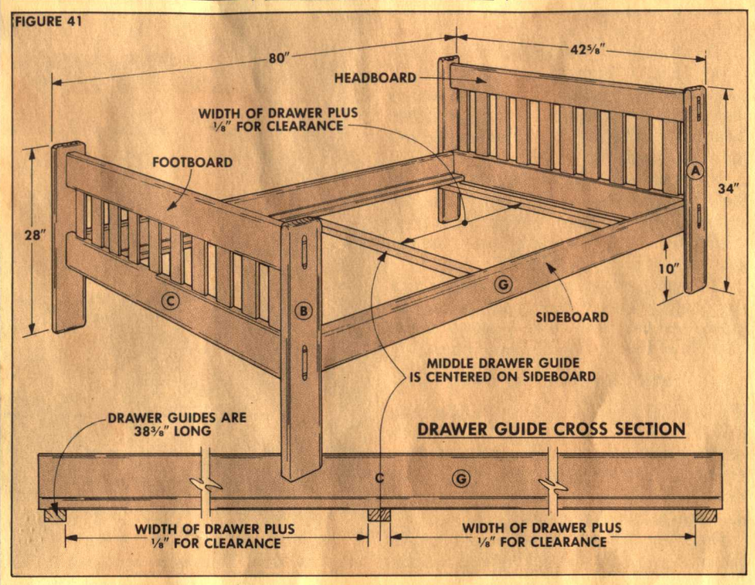
Overall Dimensions: 42⅝"W x 80"L - 34"H

For Single Bed:		
A	Headboard Uprights (2)	1 1/16 x 4 - 34
B	Footboard Uprights (2)	1 1/16 x 4 - 28
C	Cross Rails (4)	1 1/16 x 5 - 42
D	Headboard Slats (10)	⅜ x 2 - 13½
E	Footboard Slats (10)	⅜ x 2 - 7½
F	Spacer Strips (4)	⅜ x ½ - 40½
G	Side Boards (2)	1 1/16 x 5 - 75
H	Cleats (2)	1 1/16 x 1½ - 75
For Drawers:		
I	Drawer Front (2)	13/16 x 7¼ - 35⅝
J	Drawer Sides (4)	½ x 7 - 20
K	Drawer Back (2)	½ x 7 - 33⅝
L	Drawer Bottom	¼ x 18¾ - 33⅝
M	Drawer Guides (3)	1 1/16 x 1¾ - 38⅜
For Ladder and Guard:		
N	Ladder Uprights (2)	1 1/16 x 2 - 49
O	Ladder Rungs (4)	13/16 x 2½ - 12½
P	Guard Rail (1)	1 1/16 x 5 - 36
Q	Guard Uprights (2)	1 1/16 x 2 - 13½

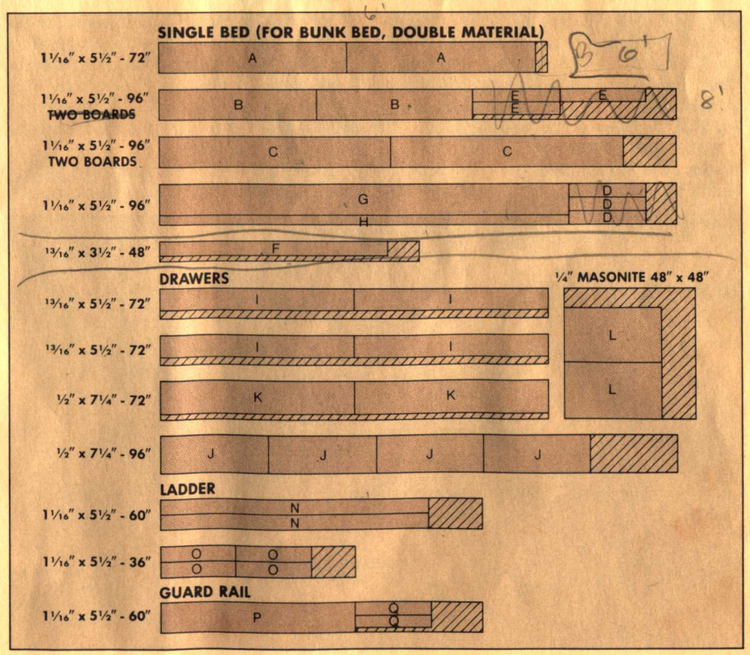








CUTTING DIAGRAM



Bunk Bed

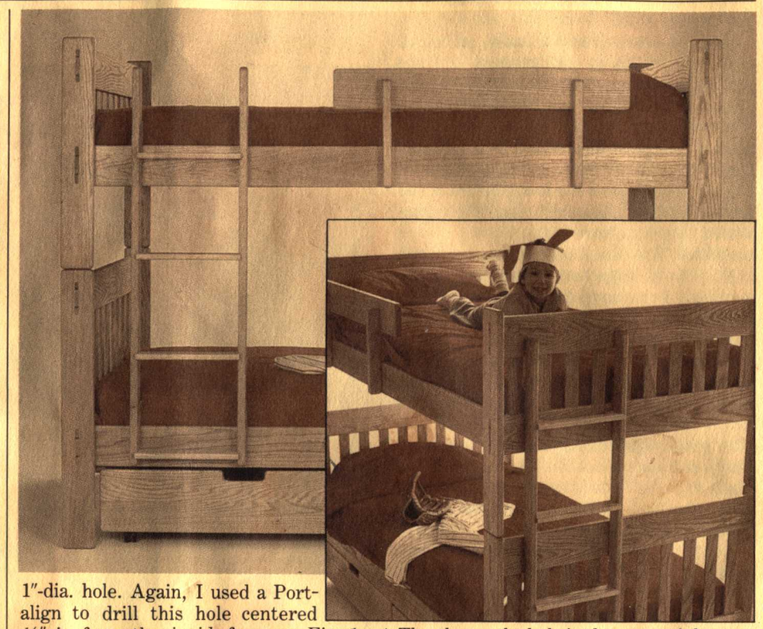
STACK 'EM UP FOR TWICE AS MUCH SLEEP

If you want to make a bunk bed, it's just a matter of building two single beds and stacking them. But that's not the whole story.

The single bed is designed with a headboard that's 6″ higher than the footboard. If you want to make two beds to form a bunk bed, the lower bed is built with two headboards (34″ high) and the top bed has two footboards (28″ high).

Normally bunk beds are stacked and held in place with a steel pin in the uprights. This pin keeps the uprights from sliding off — but it doesn's *secure* the upper bed to the lower bed.

If the guy in the lower bed tries to kick his brother out of the upper bunk, the whole bed can come loose — much to the chagrin of the one in the lower bunk.



KNOCK-DOWN FITTING

We thought it would be nice to add a little safety feature here by joining the uprights with a knock-down fitting, see Fig. 1. This fitting consists of a steel pin that screws into a plastic insert on one end and attaches to a cam collar at the other end.

Note: The procedure and measurements we used to mount this fitting vary a little from the instructions that came with it.

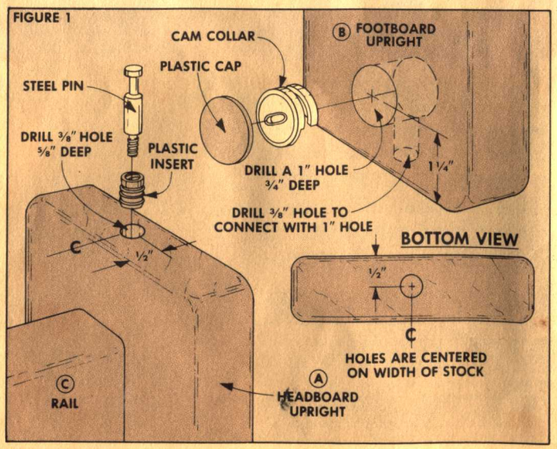
MOUNT CAM COLLAR. To mount this fitting, first drill a 1″-dia. hole on the inside face of the upper upright, see Fig. 1. (I used a Portalign and Forstner bit here.) This hole is centered on the width of the upright and 1¼″ up from the bottom edge, see Fig. 2. It's also stopped ¾″ deep.

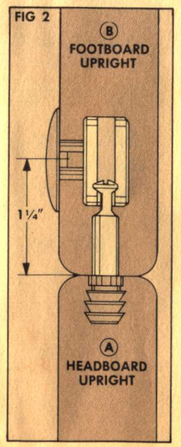
HOLE FOR STEEL PIN. Next, drill a ⅜″-dia. hole for the steel pin in the bottom end of the upright so it intersects with the 1″-dia. hole. Again, I used a Portalign to drill this hole centered ½″ in from the *inside* face, see Fig. 1.

HOLE FOR INSERT. Finally, drill another ⅜″-dia. hole in the bottom upright for the plastic insert. This hole is also centered on the width of the upright and ½″ in from the inside face. (It must line up exactly with the hole in the bottom of the upper upright.) After this hole is drilled, tap the plastic insert in place.

MOUNT FITTING. To mount the fitting, screw the steel pin in the plastic insert. Then lower the hole in the top upright over the steel pin (see Fig. 2), and push the cam collar in the 1″-dia. hole. Use a screwdriver to twist the cam collar so it catches the head of the steel pin. (As the collar is turned, the cam action pulls the steel pin tight inside the collar.)

Finally, cover the holes with the plastic cap that comes with the fitting, see Fig. 2.





THE LADDER

No bunk bed is complete (or any fun) without a ladder. The ladder I made hooks on the side rails of both beds.

LADDER UPRIGHTS. The uprights (N) for the ladder are cut from a piece of 5/4 stock, 49″ long, see Fig. 3. In order to have the dadoes for the rungs line up exactly, I cut this piece double-wide to begin with. (Wide enough for two 2″-wide uprights plus ⅛″ for the kerf between them and a little for trimming it up.)

CUT DADOES. To mount the rungs, cut four ¼″-deep dadoes across this piece. (Note: When setting up these cuts, check the width of the dado with the actual stock to be used for the rungs. The rungs should fit tight in the dado.)

The first dado (at the bottom of the ladder) starts 1″ from the end. The next three are spaced 12″ apart, see Fig. 3.

COMPLETE UPRIGHTS. After the dadoes are cut, rip the workpiece down the middle and trim it to produce two uprights 2″ wide. Then round the corners to a ½″ radius and round over the edges with a ¼″ round-over bit on the router table.

THE RUNGS. Next, the four rungs (O) are cut to size out of 4/4 stock, 2½″ wide by 12½″ long. Since the top rung is positioned right in front of the side board on the top bunk. I notched out the back edge to allow room for a hand-hold.

Drill two 1″-dia. holes 8″ apart and centered ½″ from the back edge, see Fig. 6. Then cut out the shape of the hand-hold, rounding the back corners of this notch to a ½″ radius.

ROUND EDGES. Finally, round the front and back edges of all four rungs with a ¼″ round-over bit. (Do not round the ends — leave them square.)

ASSEMBLY. Before final assembly, drill two ⅜″-dia. counterbores followed by 3/16″ shank holes on the outside face of the uprights, centered over the dado, and ½″ from the front and back edges, see Fig. 5.

Then place the rungs in the dadoes and clamp the ladder together so pilot holes can be drilled through the uprights and into the ends of the rungs.

After the pilot holes are drilled, apply glue to the dadoes and screw the rungs in place with No. 8 x 1½″ woodscrews, and cover the counterbores with ⅜″ plugs.

HOOKS. To attach the ladder to the bed, I made four hooks that hook over the side boards. First, rip four spacer blocks to width to match the thickness of the side board, and to a length of 3″, see Fig. 7.

To mount the blocks to the ladder, mark the position of the bottom blocks so they're 5″ up from the bottom ends of the uprights. Then to get the position of the top block, measure the distance from the top edge of the bottom side board to the top edge of the top side board. Mark off this same distance on the ladder uprights — from the bottom block to the top block.

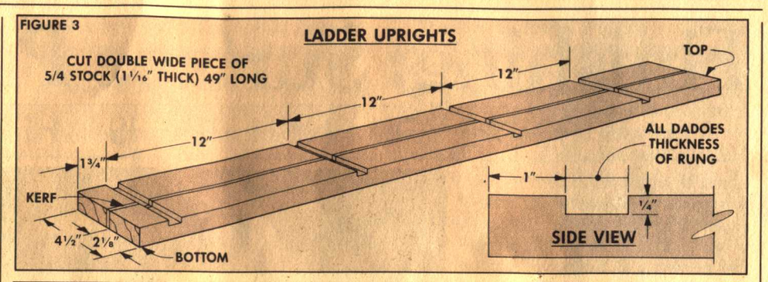
Pre-drill the pilot holes on the spacer blocks to match the holes on a ¾″ x 6″ mending plate. Also mark and pre-drill holes in the ladder's uprights. Then glue and screw the spacer blocks and the mending plates to the ladder, see Fig. 7.

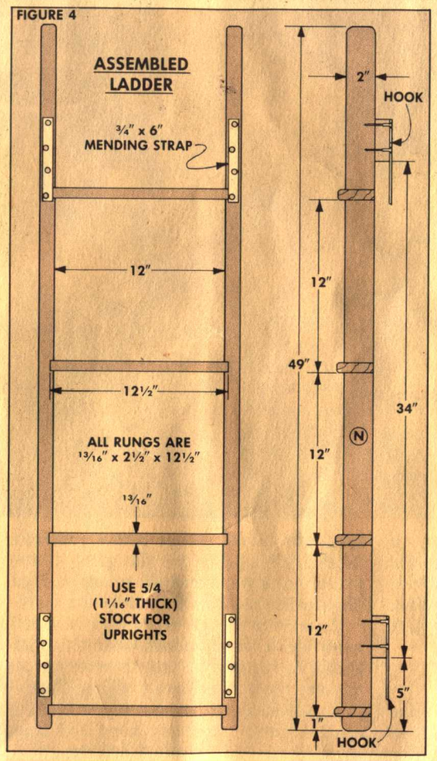
GUARD RAIL

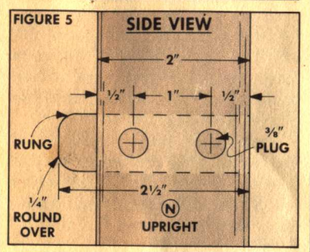
For smaller children it's also a good idea to add a guard rail. The one I built is a piece of 5/4 stock, 5″ wide by 36″ long, see Fig. 8.

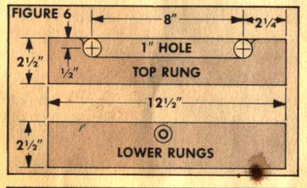
It's mounted to the bed with two uprights and two hooks (as on the ladder). Cut the uprights 2″ wide by 13½″ long and glue and screw them to the guard rail.

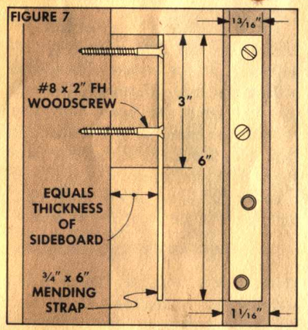
Then mount hooks the same way as on the ladder: cut the spacer blocks, pre-drill the pilot holes, and then glue and screw the spacer blocks and ¾″ x 6″ mending plates to the edge of the uprights. And that completes the bunk beds.

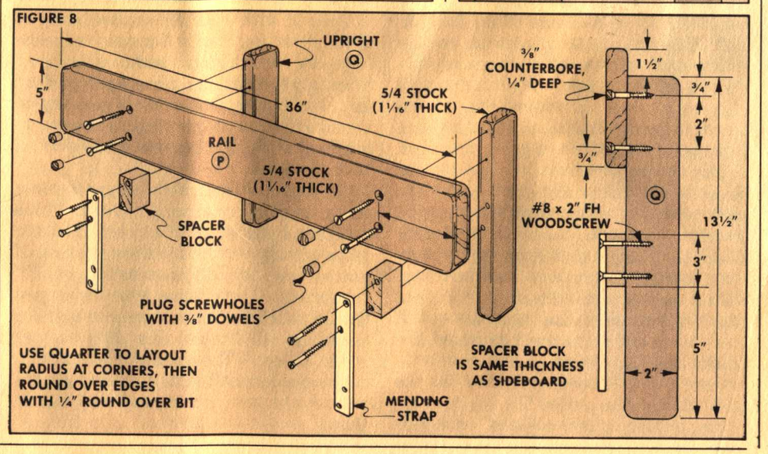






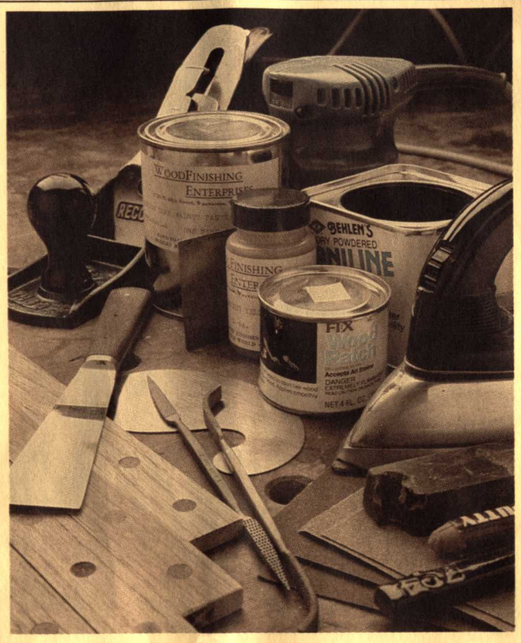






Finishing: Surface Preparation

BEFORE YOU FINISH, THIS IS WHERE TO START



I have to admit that there are certain parts of woodworking that I enjoy more than others. Getting a tenon to fit so it slides into a mortise perfectly is definitely on the positive side. So is putting on and rubbing down the final coat of finish. It's somewhere in between these peaks that I get bogged down in some of the more mundane chores of woodworking.

Specifically, it's the process of making sure the surface is ready to take the finish. It's at this point that all the little problems and mistakes that have been building up from the beginning of the project are now staring me right in the face . . . and I have the challenge of fixing them.

It's also at this stage of the project that every woodworker's favorite activity, begins . . . sanding. (As I said, there are parts of woodworking that I enjoy more than others.)

I find it easiest to approach finishing like anything else in woodworking. It's a series of steps to obtain the desired result. But it's also a series of decisions. Once you make a certain decision, to stain the project for example, that decision affects many of the steps that lead up to it. I try to develop a plan for finishing at the start of a project and carry it through to the end.

UNDER CONSTRUCTION

While I'm building a project a little voice somewhere in the back of my head keeps asking me, "How will what you're doing now affect the appearance of the final finish?" The voice gets louder at certain points in the construction process.

EDGE-GLUING. One of the first times this happens is when I'm edge-gluing several boards to form a wide panel. Two things are important here: color and grain structure. To play down a joint line, I try to select the pieces so the colors and grain blend into each other. It's a matter of being careful now instead of trying to selectively stain or bleach later to get a uniform appearance.

EXCESS GLUE. Another time I hear that voice is when it comes time to glue. Excess glue in a joint will cause "squeeze-out." If these beads and globs aren't removed, the finish, especially stain, won't penetrate into the wood. It ends up looking like the piece has chicken pox.

The problem is that some of these glue spots are difficult to see before you start finishing. I usually see the globs at the joints, but always manage to miss a light fingerprint smear in the middle of a board.

It seems as though every woodworker I know has a theory about when this glue should be removed. These theories run all the way from immediately wiping the excess glue away with a wet rag to waiting until it gets completely hard and then chipping at it with a chisel or scraper.

I agree with John Moser, president of Wood Finishing Supply Company, when he explains: "The typical white and yellow glues go through certain stages as they dry. First they skin over. If you try to remove the glue at this stage, you open up a blister that just deposits fresh glue all over the place.

"If you let it dry a little longer (usually about an hour), you can go over it with a scraper (I use a paint scraper) and the globs actually come off in their entirety. If you wait too long, they're tough to get off."

"OOPSES." There's one more thing you should watch for when a project is under construction. Around our shop we call them "oopses." These are the little dents, chips, gouges, and scratches that always seem to happen when you least expect them.

I'm really talking about three different things here: dents, where the wood cells are crushed; chips where the wood cells are actually missing; and gouges and scratches where the wood cells are severed.

DENTS. If a blunt object (like a hammer) strikes a piece of wood, the wood cells are crushed and collapse into their hollow centers. All the cell walls are still there, but they're compressed. That's a dent.

Sometimes a dent can be raised back to it's original level by simply applying a drop of water to it. The water flows into the wood and swells the walls back to their original shape. If the water needs a little help in order to penetrate the cell walls, I may prick the spot with a pin.

Or I use an iron. I take a piece of damp cloth or paper towel, put it over the dent, and hold a hot iron to it until the cloth dries out. The iron causes steam to penetrate the wood cells and swell them back to their original shape. After it has dried thoroughly, it can be sanded.

In addition to major dents, the minor ones that collect on the surface of the workpiece can be aggravating. It seems like somewhere during a project I will set down a piece of wood on top of a chip or dried glue glob on my bench. This usually causes a minor dent that has to be raised.

Ken Burtch, a professional refinisher and owner of The Hardwood Connection in DeKalb, Illinois, tells an interesting story about some minor dents he once had on a project: "When I first got started I took some boards to a local cabinet shop to have them resawn and run through their thickness planer. The dust collection system on the planer wasn't operating correctly and the feed rollers smashed all the chips down making dents all over my nice cherry.

"I thought I could easily repair it by using a belt sander to erase all the wood surrounding the dents until the surface got down to their level. When everything was level, I put a glass-smooth finish on it.

"It wasn't until a couple years later that disaster struck. The seasonal changes allowed mositure in the air to slowly enter the wood. The stress in the dents was relieved and some of the dents are now raised spots. If I could do it again, I would have raised the dents first."

CHIPS. A chip or a splinter is different from a dent. In this case the wood is actually missing and moisture won't help. The first thing I do when a splinter flies off my work (this seems to happen a lot when using a router) is get down on my hands and knees and start looking through the sawdust. Somehow it always seems to find a resting spot under the very back of the bench. When I rescue it, I put a little glue on it and clamp it back in place (usually masking tape works best to hold a small splinter while drying). When it's dry I'm usually able to sand it smooth.

GOUGES. A gouge or scratch is something completely different. In this case the wood cells have been severed. Moisture won't help and there isn't a chip to replace.

I think you are faced with three choices with a gouge or missing chip: First, you can set aside the piece and start over. Wait, do you mean throw it in the scrap bin? Yes, that's often the best solution if it's in a critical spot such as a tabletop.

Second, you can live with it. Especially if it's a deep gouge that can't be sanded out and you don't want to replace the piece. In this situation I develop the philosophy that it's part of the "character" or "patina" of the piece. I always feel better when I tell myself it might have happened when it was moved upstairs to the living room.

Finally, you can try to repair it. Unfortunately, this sometimes creates more problems. If not done properly it makes the gouge or chip more prominent.

REPAIRS

With a shallow gouge or scratch, I'm often able to plane, scrape, or sand the surrounding wood. On a flat surface I try to even it out by feathering out the surrounding area to create a shallow depression (This depression has to cover an area 3 to 4 inches in diameter or you're just transferring a scratch into what looks like a large dent). On an edge I feather a gouge or chip until it blends in with the edge.

If these methods don't work, the subject always turns to filling. At *Woodsmith*, we try to keep our use of putties and fillers to a minimum. (I'm talking here about wood fillers, not *paste wood fillers* that are used to fill pores in open-grained woods.) Putties and fillers always look to me like a band-aid solution to a major problem. For example, we might use putty to fill in along a joint line where it isn't so obvious. But we don't use it in the middle of a tabletop to repair a gouge.

PUTTIES. There are a wide variety of plastic putties, water putties, putty sticks, cabinetmaker's waxes, and burn-in sticks on the market. They're advertised as being available in "an assortment of colors to match any wood."

That's always bothered me. Even though a common brand plastic putty is available in both "Light Oak" and "Dark Oak," I can't remember ever seeing actual oak wood only available in two colors. It's available in an infinite number of colors. And as natural oak ages it darkens. Plastic wood fillers don't. Their color may start out as a close match, but it rarely stays that way. And then the patch stands out.

Color isn't the only problem. Some fillers are incompatible with various finishes or are designed for other uses. Water putty (a powder material) won't accept any stains or oils when it's dry. (It's used when the surface will be painted). Cabinetmaker's wax never gets completely hard. Putty sticks also don't get hard and are best used for filling nail holes *after* finishing. Burn-in sticks (also called shellac sticks and lacquer sticks) are usually used to repair damage on finished furniture.

PLASTIC PUTTIES. Plastic putties (of which there are many brands) have one big advantage over these other fillers: They're made from actual wood fibers and a plastic binder. The wood fibers allows them to accept stain and gives them some of the qualities of wood and the plastic binder hastens the set-up time. (Out of all the fillers we've tried, the one I like the best is called FIX Wood Patch. I use it mostly for filling joint lines that aren't as tight as they might be. It also accepts stain better than most of the others.)

MIXING YOUR OWN. The main problem with all of these manufactured products is that they're not 100% wood. You're introducing a foreign substance that works differently than the wood itself. For this reason sometimes I'll mix my own filler with fine sawdust and a few drops of the finish I'm going to use on the project. I use the mixture most often on the end grain of a joint, such as a box joint, where it can turn dark (and it will) and won't be noticeable.

One other thing. Many people recommend mixing glue with sawdust as a filler. I have found that when glue is used, it effectively seals out any finish altogether — creating white blotches.

USING THE WOOD ITSELF. Probably the best solution for big defects is to use a piece of the wood itself. A plug cut out of the bottom of the piece, or a piece of veneer can often be patched into a spot. It's a more permanent solution and easier to color match and finish.

MILL MARKS

The most common problem I run into in just about every project is mill marks. These are uniformly spaced ridges that run across the width of planed lumber. They're caused by the rotation of a planer or jointer's knives

FINISHING TIPS . . . *from our shop*

- **BLACK BLOTCHES.** Black marks often appear at joint lines (particularly on oak) anywhere glue comes in contact with pipe clamps. These marks are the result of a chemical reaction between the water in the glue, the iron in the pipe clamps, and the tannin in the wood. To prevent this, place strips of waxed paper between the clamps and the wood at the glue line.
- **COLORED GLUE.** Add a drop or two of food color to glue so it shows up better. This is particularly helpful for finding smears in places where you don't expect or want them.
- **PAINT SCRAPER.** When edge gluing boards, the glue squeeze-out at the joint lines can be easily removed with a paint scraper — the kind used to scrape paint off houses. I bought one that has a removable blade so I could sharpen it — a dull blade "skates" over the surface.
- **REMOVING BURNS.** Using sandpaper to remove burn marks is a lot of work. A hand scraper (a 3 x 5 piece of steel sharpened with a burr edge) does the job easily — especially on end grain. If for no other reason, it's worth learning how to sharpen a scraper to remove burns.
- **WORKING ON INSIDE CORNERS.** When gluing up a cabinet, don't use a damp cloth to remove glue from an inside corner — it just smears and creates a bigger mess. Instead, wait until the glue has reached a paste stage (about 20 minutes), and remove it by running the corner of a hand scraper along the inside corner of the joint.
- **ANGLED LIGHT.** To check for mill marks and sanding scratches, hold a mechanic's light at a low angle over the wood. The low-angle light will create a shadow on even light scratches. I use a clear (not frosted) light bulb to create more glare.
- **CHECK FOR SMEARS.** One of the most difficult problems to catch is a light glue smear. To check for these, wipe or spray a fine mist of naphtha over the surface. (Naphtha is a clear, non-staining liquid that won't raise the grain.)
- **TACK RAGS.** To make your own tack rag, use a piece of cheesecloth, a clean handkerchief, or a well-washed diaper. Saturate the cloth with turpentine and wring it out thoroughly. Apply streaks of varnish across the cloth, roll it up, and wring out completely. Continue adding varnish until it's evenly distributed in the rag and the rag feels sticky, not gummy. Store in a sealed jar or Zip-lock bag so the rag stays tacky.

  When using a tack rag, *lightly* wipe the entire surface of all dust. Don't rub hard or the varnish will be deposited on the workpiece and interfere with finishing.

taking shallow "bites" out of the wood. If the knives are dull or the feed rate too fast, the ridges really stand out.

The first problem with mill marks is finding them. Sometimes they're difficult to see. But if I get my eyes down at a very low angle to the wood, I can usually see some faint ridges.

Once I find them, the next problem is removing them. (If they're not removed, the second the finish goes on they'll stick out like furrows in a freshly plowed field.) A couple light passes with a sharp plane usually does it. I find it's easiest to do this on all the wood *before* assembly.

Occasionally I'll use a pad or belt sander (with 100 grit paper) to remove mill marks. But I find it often takes a lot of work with a pad sander, and I always get a little nervous about gouging and rounding edges with a belt sander.

Sometimes after the project is assembled I'll discover some mill marks I missed. In this case I use a scraper. (This is a 3 x 5 piece of steel with a cutting burr on the edge, see *Woodsmith* No. 14. A scraper also works quicker than sanding for removing machine *burns* caused by planers, routers, and saws.) A scraper works best if it's held at an angle to the ridges so it's not riding up and down with them — but it's cutting off their tops.

RIDGES, SNIPES, AND TEAR-OUT. In addition to mill marks, planers and jointers have a way of doing other undesirable things to your wood. A small chip in the knives can leave a little ridge the length of the board. This can usually be scraped off with a hand scraper.

If the planer or jointer isn't adjusted correctly, a snipe (gouge) can be taken out at the beginning or end of the boards. Once again, this has to be removed (or better yet cut off), or it will stand out like a sore thumb after finishing.

And there's always the possibility of grain tear-out where the grain shifts directions (such as around a knot). This usually has to be sanded out.

SANDING

When preparing this article it seems as though questions about sanding came up the most. Jerry TerHark on the staff of the wood finishing program at Dakota County Area Vocational Technical Institute in Minnesota explained, "Without the proper sanding many things show up once you put your stain and finish on. A good sanding job will either make or break the piece."

When do you start sanding? If at all possible, *before* assembly . . . but after planing. I've always found it easiest to use a hand plane or scraper to get out all the mill marks and generally flatten the surface.

But it's difficult to get a consistent surface all the way across a tabletop with a hand plane or cabinet scraper. That's when sandpaper comes in. It provides consistency. Consistent little scratches.

It helps to know a little about the different types of sandpaper and grits. (See the article on sandpaper in *Woodsmith* No. 33.)

SANDING ROUTINE. I usually start sanding with aluminum oxide paper (100 grit) on an orbital palm sander. From there I jump to 120, then 180, and then stop. I finish off by handsanding with a block and 180 grit paper moving with the grain to remove any of the slight swirls caused by the orbital action of the palm sander. That's as far as I go.

There are some people who go up to 600 grit, but I think it's ridiculous. Sanding this fine burnishes the wood fibers and fills the pores with fine dust. Stains won't soak in evenly and oils won't penetrate. Besides, who likes sanding any more than necessary?

Ken Burtch says, "The biggest mistake woodworkers experience is when they have mill marks or defects — they grab 220 grit sandpaper and work for hours. Sometimes it seems barbaric what you have to do, but for the sake of speed, you should go to the appropriate grit."

Let's back up a bit with a few specific questions about sanding:

Shouldn't I make sure I sand with each grit and not jump grits? Tom Eckstein, a product development engineer for 3M says, "There's really no reason to go every grit step. The reason there are so many grits is some of them are designed specifically for very special applications. And when you start using them you won't see any benefit going up every number."

Will I get a different looking finish based on how fine I sand? To some extent this is true, but it also depends on the wood you're using. Tom explains, "If I have nice straight grain oak and there aren't any knots in it, I've stopped as low as 120 grit and stained it. Because the coarse grain marks in oak are working with the grain and the sanding marks are perfectly aligned. But closed grain woods, like maple or clear pine, are going to show every scratchmark. So you're going to want to move up to the 220 grit range on these woods."

Is there any time it's okay to sand across the grain? All the books say *never* sand across the grain. But I think there's two times it's okay. In the initial stages of sanding when I want to remove a lot of wood, I use a belt sander to go across the grain. I'm just trying to quickly get the surface level. Then I follow it up by sanding or handplaning with the grain to remove the cross-grain scratches, and I proceed to sand with finer grits.

The other situation when you're almost forced to sand across the grain is at a joint where two pieces of wood come together at an angle, such as a miter or rail and stile. On these joints I want the two pieces to be level across their faces. Sanding across the joint does just that. In this case it's almost a necessity to sand across the grain on one of the pieces since it's difficult to come to a halt right at the joint line.

Tom Eckstein explains his method for sanding miters, "I sand the corners a couple grits finer than I would normally. What happens is that I still sand across the grain on one of the frame pieces but I'm sanding with such a fine grit that it doesn't make much difference."

Should I raise the grain by wetting the wood and then sand it off? Wetting the fibers allows any cell walls that have been pressed down or damaged from sanding to swell and stand up. Then you can let it dry and remove the whiskers by sanding at a slight angle to the grain with 180 grit sandpaper.

To be honest, I don't find it necessary. The only exception to this would be when I plan on using a water-based stain or dye. Then it's necessary or the stain or dye will raise the grain when it's applied.

SANDING HINTS. A couple final thoughts on sanding. When using a pad (or palm) sander be sure that the sandpaper can't move on the bottom of the pad. Tom Eckstein explains, "You only generate so much power in the motor and if you let it slip between the pad and the sandpaper you're generating heat — not sawdust. It's just rubbing the back of the sandpaper."

As the last step in sanding, I go over the entire project and soften the sharp edges (technically, the arrises). I don't really round them, but just make one pass to break them with 120 grit paper. It removes the knife-sharp edges, helps prevent splinters, and gives a comfortable feel to the piece. In addition, surface finishes usually will rub right off a sharp edge.

FINAL INSPECTION

The last bit of advice can be summed up in one word: patience. Don't rush into applying the finish. I make one last inspection for any remaining problem areas. I start by brushing off the majority of the sanding dust and then lightly wipe the whole piece down with a tack rag.

With all the dust off, any final mistakes or problems become apparent. Once again, holding the piece at a low angle to the light helps make any problems stand out.

If it looks okay, I go ahead and finish it right away. All kinds of things happen to unsealed wood sitting around our shop. Humidity alone can raise the grain in a couple days. Not to mention everyone who has just come back from lunch at McDonald's. It never fails . . . I just finish sanding and they come in with their oily fingers to check out my sanding job.

And then it's back to that enjoyable task of sanding. Sometimes you just can't win.

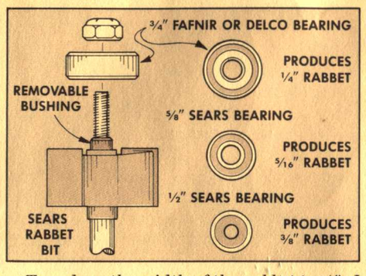
Talking Shop

AN OPEN FORUM FOR COMMENTS AND QUESTIONS

THE ELUSIVE ¼" RABBET BIT

In Woodsmith *No. 36, you mentioned that you had been looking for a carbide-tipped, ball bearing rabbeting bit to cut a ¼"-wide rabbet. I ran into the same problem, but I've come up with a solution.*

What I did was purchase a Sears ⅜" carbide-tipped rabbet bit (#9GT25582, $12.49 catalog price). I also purchased the arbor set (#9GT25895, $6.69 catalog price) for the rabbeting bit. This set includes a ½"-dia. bearing for cutting ⅜"-wide rabbets, and a ⅝"-dia. bearing and bushing for cutting 5/16"-wide rabbets.



To reduce the width of the rabbet to ¼", I purchased a ¾" outside diameter bearing (Fafnir #S1KDD) at a bearing supply house that fits over the Sears bushing supplied with the ⅝"-dia. bearing. This combination produces a ¼" carbide-tipped ball bearing rabbeting bit.

Earl Clark
Holland, Texas

We've tried to purchase bearings for rabbeting bits several times in the past. The problem we kept running into was finding a bearing that had the correct inside diameter to fit the arbor on a rabbet bit. Finding a bearing with a ¾" outside diameter was easy, but trying to find one that fit on a rabbet bit — any rabbet bit — was next to impossible. Or so we thought.

As soon as I read Earl's idea, I called a local bearing supplier and sure enough, they had the bearing that fit over the Sears bushing — although it was a different brand and stock number (Delco 77R4A). They said it's a typical bearing, and if a supplier doesn't have one of these two brands, they should be able to cross reference their numbers to a brand they do carry.

After we purchased the bearing, everything went together perfectly. And we've been cutting ¼" rabbets ever since.

SMOKING SANDERS?

I have a question about a potential safety problem in my shop. Whenever I'm sanding a project in my basement shop, the basement becomes filled with very fine sanding dust. Because my gas water heater and furnace are both completely exposed, I'm concerned that the sanding dust may be a fire or explosion hazard.

Richard Kavelitz
Lilburn, Georgia

To find an answer to your question, I contacted three experts: our local fire marshal, our state OSHA office, and the National Fire Protection Association (NFPA).

First of all, I found out there's a significant difference between a dust fire and an explosion. A dust fire occurs when a particle of dust comes in contact with an igniting source (such as an open flame). If there's a high enough concentration of dust particles in the air, every time a particle burns, it ignites the other particles around it. This can develop into a chain reaction — or flash fire that spreads like a wave across a room.

A dust explosion, on the other hand, results from a large flash fire that occurs in a tightly enclosed area. However, for an explosion to occur, it takes just the right set of conditions and sequence of events. It should be of some comfort to know that it's all but impossible to produce a dust explosion in a home workshop.

Even a flash fire in a home shop is only theoretically possible, according to Bob Benndetti of the NFPA. It would almost have to be intentional — like throwing a bucket of sawdust in the air in front of an open flame — to achieve the concentration of airborne dust needed to keep the chain reaction in progress.

In a home shop, even during heavy sanding conditions with little ventilation, the concentration of sanding dust in the air just isn't high enough for a flash fire to occur. And by simply providing a little ventilation, there shouldn't be a problem.

CURLING CABINET TOPS

I built the blanket chest shown in Woodsmith *No. 32 and it turned out beautifully. However, I've run into a problem. When I brought it in from my garage shop in late December, the top cupped (front to back) after only a couple of days. I was devastated when I saw this after all my hard work hand cutting the dovetails.*

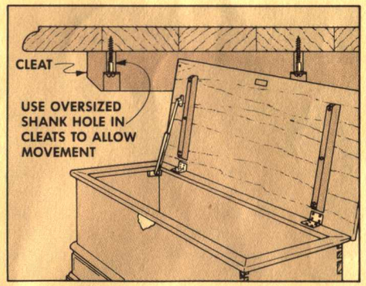
I contacted a local cabinet shop, and they explained that the dry air inside our house wasn't able to circulate inside the chest. This caused a moisture imbalance between the inside and outside faces of the lid.

On the outside (top) face, the lid is exposed to the dry interior air, and shrinks as it dries out. On the inside face, where there's little if any circulation of the dry interior air, the top remains basically the same. The end result of this imbalance is that the top curls up, or cups.

The cabinet shop I talked to suggested attaching cleats on the inside face of the lid to help hold it flat. What do you think, is this the answer to keeping the lid flat? If so, how should the cleats be attached to the lid?

Joe Cuncic
Sault Ste. Marie, Ontario

This winter, we had exactly the same problem. Slowly but surely, the top on the chest started to cup. And before long, there was a 5/16" gap between the lid and the front of the chest.



As you mentioned, one way to help prevent the top from cupping is to attach cleats across the width of the lid. The thing to remember when using cleats is that they must still allow the top to expand and contract, while at the same time help keep the top from warping.

The way I do this is to cut an oversized shank hole for the woodscrews. This allows the woodscrew room to move with the lid as it expands and contracts, while at the same time keeping the cleat tight against the lid to resist warping.

Although using cleats will help prevent some of the cupping, this isn't a cure-all. Under severe conditions, the top may still cup to a point. (After all, part of the joy of working with solid wood is that it's still alive enough to move.)

Sources

DOLL CRADLE

You can order the screw hole buttons for the doll cradle from:

THE WOODWORKERS' STORE, 21801 Industrial Boulevard, Rogers, MN 55374; (612) 428-4101 (Note: $7.50 minimum cash order. Catalog: $2.00). *Screw Hole Buttons* (8), Birch, ½", Order No. B1011, $1.25 per 50.

TV/VCR STAND

You can order all of the hardware needed for the TV/VCR stand from the following sources:

THE WOODWORKERS' STORE, (address above). *Drawer slides* (1 set), 18" long, Order No. D7541, $13.25 per set. *2" Plate Casters*, Order No. C1143 (black), $16.40 per set of four.

CONSTANTINE'S, 2050 Eastchester Road, Bronx, NY 10461; 800-223-8087 (Note: $7.50 minimum order. Catalog: $1.00). *Glass Door Hinge* (2 pair), Order No. GH7030 (Black), $4.45 per pair. *Slip-On Handles for Glass Doors*, (4), Order No. GP7011 (Black), $.75 each. *Magnetic Touch Latch*, double unit, Order No. ML772, $3.45 each.

We had a local glass supplier cut two pieces of ¼" smoked glass to the correct size for the doors. The total bill: $10.74.

BED/BUNK BEDS

You can order the hardware for the beds and bunk beds from:

THE WOODWORKERS' STORE, (address above).

For single bed: *Threaded Inserts* (4), 5/16" x #18, Order No. D3961, $.32 each.

For bunk beds, Four more *Threaded Inserts* (same as specified above). *Elite (knock-down) Fittings* (4), D4170, $.50 each.

For drawers and drawer guides: Six more *Threaded Inserts* (same as specified above). *2" Plate Casters* (2 sets), Order No. C1143 (black), $16.40 per set of four.

We purchased the *machine bolts* (5/16" x 1¼") and *washers* for the threaded inserts and the six *mending straps* (¾" x 6") needed for the bunk bed ladder and rail at a local hardware store.

We discovered in designing the beds that there is some variance in the dimensions of twin size mattresses and springs. Most state that they will "fit a 39" x 75" bed" but the actual measurements are smaller. We used a mattress and 2" thick mattress-board from Sears (catalog no. 1 A 70109N, $27.99) that *actually measures* 37½" x 74". But the bed is designed to hold any mattress 36" to 39" wide.

SURFACE PREPARATION

We mentioned in the article that we like FIX Wood Patch. We buy it locally since there aren't any mail order sources. Find the location of the nearest dealer by calling the Darworth Co. at 800-624-7767.

We talked to a number of helpful people to get the information for this article. Special thanks go to Ken Burtch, professional refinisher and owner of The Hardwood Connection, a fine tool and wood store in DeKalb, Illinois; Rick Stohr, branch manager of 3M's surface preparation products; Tom Eckstein, 3M product development engineer; Jerry TerHark, on the staff of the wood finishing program at Dakota County Area Vocational Technical Institute in Minnesota and owner of a refinishing shop; and John Moser, president of Wood Finishing Supply Company.

Jerry TerHark explained that the DCAVTI wood finishing program is the only program of its kind in the country. It's a ten-month, accredited program that trains students of all ages to become accomplished finishers/refinishers. For more information about the program contact Jerry at DCAVTI, 1300 145th Street East, Rosemount, MN 55068 (612) 423-8362.

John Moser has offered to help any *Woodsmith* readers who want further information about preparing the surface, finishing, and Behlen finishing products. The Wood Finishing Supply catalog begins with a thorough description of how to prepare the surface and use a variety of finishing materials. Then there's a description explaining when, where, and how to use each of the products they carry. The catalog is available for $2.50 from Wood Finishing Supply Co., 1267 Mary Drive, Macedon, NY 14502; (315) 986-4517.

BOOK ON FINISHING

In researching the article on preparing the surface we found an excellent book about preparing the surface, refinishing, and finishing. *Wood Finishing and Refinishing* by S. W. Gibbia has step-by-step instructions on all phases of finishing.

It's available in hardcover for $14.95 ppd. (Order No. 10LO4-CY) from Woodcraft Supply Corp., 41 Atlantic Avenue, Box 4000, Woburn, MA 01888; 800-225-1153. Note: $10 minimum order. Catalog: $3.00 (credited on first order).

WOODWORKING CLUBS

We keep hearing from woodworking clubs all over the country:

WOODWORKERS' ASSOCIATION OF TOPEKA. A year and half ago Cleo Mc Donald got a group of woodworkers together to show them his continuing shop project, a one-quarter scale collection of early American tools. This association sprang from his presentation and has grown to over 30 members. If you are interested, contact Cleo Mc Donald, President, 9421 NW 42nd Street, Silver Lake, Kansas 66539.

SAN DIEGO FINE WOODWORKERS ASSOCIATION. This growing group on the west coast meets once every two months. For more information, contact Chuck Meechum, President, P.O. Box 99656, San Diego, CA 92109.

THE WOODWORKERS' GUILD OF GEORGIA, INC. Charles Boelkins, secretary of this group, recently called to get the names of other woodworking organizations in the southeastern United States. He explained they are planning a major regional juried show and would like to contact interested clubs. (If your club wants to get involved, contact him at the address below.)

The Guild has been in existence for five years and has over 100 members. They meet every month in Atlanta. Their project to donate toys to a children's hospital was recently featured on the television show "PM Magazine." Find out more about them by contacting Charles Boelkins, P.O. Box 1113, Conyers, Georgia 30207.

THE WOODWORKERS' GUILD OF THE LEXINGTON (MA) ARTS AND CRAFTS SOCIETY. This guild has 50 men and women whose skills range from beginner to master craftsman. They provide a well-equipped shop for the use of their members. New members are welcome. To learn more about the Guild, contact the Membership Secretary, 130 Waltham Street, Lexington, MA 02173.

TERC WOODWORKING CLUB. This group has about 250 members and a very complete woodworking shop supported by the Tennessee Eastman Company. They are involved in community projects such as Toys for Tots and building an outdoor fitness trail. Get more information by contacting Jack Bracy, President, TERC Woodworking Club, P.O. Box 1972, Kingsport, TN 37662.

NORTH TEXAS WOODWORKERS' GUILD. (An update). In *Woodsmith* No. 35 we listed this group in the Dallas area. The contact person we printed at that time has moved. The new contact is Gloria Jacobus, 9500 Inwood Road, Dallas, TX 75220.

Southern Illinois. A group of woodworkers is organizing in southern Illinois this spring. They are looking for help, suggestions, and members. If interested, contact Tom Hanley, Rt. #1, Box 128, Creal Springs, IL 62922.